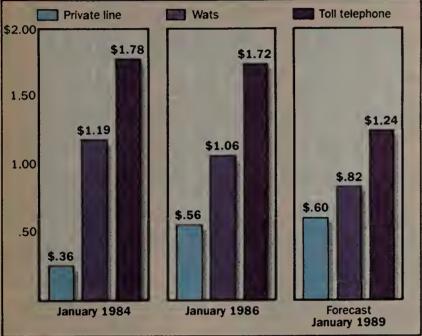
THE WEEKLY FOR LEADING USERS OF COMMUNICATIONS PRODUCTS & SERVICES

**VOLUME 3. NUMBER 29** 

SEPTEMBER 22, 1986

#### Average cost per call by service category



Amounts In dollars

SOURCE: CCMI/MCGRAW-HILL, INC., RAMSEY, N.J.

#### **EXCLUSIVE**

#### **Users hit long-haul** price cut jackpot

All but private-line costs to fall.

BY MICHAEL FAHEY

Staff Writer

While private-line costs continue their relentless climb, dial-up long-distance rates will end a postdivestiture roller coaster ride. Users will enjoy if alling prices for the remainder of the decade, according to a major study released to Network World last week.

The unpublished study, drafted by CCMI/McGraw-Hill, Inc. of Ramsey, N.J., holds bad news for private-line users, who can expect rates — which have already increased 55% since divestiture — to increase even further.

But sharp declines in prices for dial-up services, including Wats as well as direct-dial long-distance, will See **Rates** page 59 ►UNIFIED MESSAGING

#### AT&T reveals new message blueprint

Confides expanded mail integration plan.

BY JOHN DIX

Senior Editor

AT&T is quietly outlining a unified messaging strategy to its largest customers that blends existing services and products with strategic, yet-to-be-announced equipment, Network World has learned. When fully implemented, AT&T's messaging architecture will make it possible for users to integrate electronic mail, voice mail and image mail services.

The strategy more clearly defines AT&T's evolving Unified Messaging Service architecture and spells out new developments and enhancements needed to

make that architecture a reality.

One product under development will make it possible for customers to transport and translate documents between disparate computer systems, including some of AT&T's own systems, IBM's Disoss and Professional Office System (Profs) environments, Wang Laboratories, Inc.'s OIS and VS-based systems and DOS-based mi-

The new thrust is evidence of AT&T's efforts to put behind it the shotgun approach to marketing the company has used since divestiture in favor of a rifle-like, pick-your-target approach, according to See ATT page 53

#### FEATURE FOCUS

#### The software side of PBX management

BY THOMAS LABELLE Special to Network World

The sales representative just left your office with a signed purchase contract and your check for a 20% deposit. Your company's new private branch exchange

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You have just been told, in a polite way, to manage the new system in a professional manner.

Many of today's sophisticated PBXs Continued on page 47

#### VETWORK LINE

Lee Data Corp. ushers in a new age as the first vendor to increase response time by tying terminal controllers to hosts over T-1 lines. Page 4.

A users group chides the FCC's Common Carrier Bureau for excluding users from a rendezvous with local exchange carriers. Page 50.

In the wake of a major reorganization, AT&T lays out incentives to encourage attri-

Sources say company is poised to pare thousands of workers. Page 53.

The FCC warns telephone customers to beware of longdistance resellers who employ pyramid selling technlques. Page 53.

#### **Features**

Small users are up in arms about state and federal telecom policies that don't jlbe. And these users find themselves caught in the widening rift between the two. Page 41.

#### ►IBM/NET MANAGEMENT

#### **Netview umbrella** opens to outsiders

BY PAUL KORZENIOWSKI

IBM moved a step closer to satisfying the desires of network managers last week when it extended the reach of Netview, its network management package, to embrace non-IBM and non-Systems Network Architecture prod-

IBM introduced products that enable Netview to manage IBM Token-Ring Networks, T-1 multiplexers and private branch exchanges and unveiled new call-accounting and network-optimization software.

See **Netview** page 59







#### NORTHERN TELECOM/APPLE

#### Mac/PBX links to debut

**BY PAM POWERS** 

Senior Editor

SAN DIEGO — Network World has learned that Northern Telecom, Inc. and Apple Computer, Inc. this week will jointly unveil products that allow Apple's Macintosh microcomputers to exchange information with other processors through Northern Telecom's private branch exchanges.

The products, to be introduced at the Telecommunications Association show here, are expected to be the first fruit of a combined development effort that began earlier this year. The Apple/Northern Telecom alliance, according to analysts, was forged in response to IBM's relationship with Rolm Corp.

Since 1982, NTI has made several forays into the realm of data processing through relationships with various computer vendors. These efforts have resulted in the integration of Digital Equipment Corp., Hewlett-Packard Co., Wang Laboratories, Inc. and Data General Corp. products with Northern Telecom's offerings.

The products to be announced this week include:

■ A modified version of Palantir Software's in-Talk communications software that has been tailored to facilitate data transfer from the Macintosh to minicomputers or mainframes through Northern Telecom's Meridian SL-1 PBX. A single keystroke instructs the software to direct data from the Macintosh, through the SL-1, to a host processor supported by the PBX. In-Talk resides on the Macin-

tosh. Roger Fetterman, Northern Telecom's director of strategic alliances, said the software is "at the heart" of the companies' joint development effort.

■ Software that allows IBM Personal Computers to transfer documents into the Macintosh desktop publishing system via the SL-1. IBM Personal Computers would be linked to the SL-1 with twisted-pair wire. The software allows the Macintosh to edit MS-DOS documents sent from the IBM Personal Computer and lets IBM users take advantage of Apple's laser printer.

■ Enhancements to Apple's electronic mail software that allow the SL-1 to support fully automated access and logon to the E-mail network. The Applelink software package has been upgraded to commit user instructions to memory, so that E-mail can be sent automatically without user instruction.

Fetterman said that other product announcements are forthcoming, but he declined to disclose details.

Sources report that sales forces at the two companies have exchanged customer lists and the firms have developed joint product literature for users of Northern Telecom switches and Macintoshes.

"When AT&T and IBM commenced muscling into each other's territory," Fetterman said, "we realized we needed full commitment to a broad range of vendors to remain abreast of competition. Apple Computer was also contemplating ways to reach a wider user base through vendor liaisons, and thus the project was conceived."

#### ► WIRING SCHEMES

## AT&T to enhance PDS with IBM, ISDN support

BY JOHN DIX Senior Editor

SAN DIEGO — AT&T is expected to announce today an enhancement for its Premise Distribution System that will make the building wiring scheme compatible with IBM wiring components and Integrated Services Digital Network interfaces, an AT&T insider told Network World last week.

The source said AT&T would unwrap the enhancement, reportedly known as the Universal Information Outlet, at the Telecommunications Association's annual meeting being held here this week. But, he added, its debut could be delayed until next month.

The Premise Distribution System is an AT&T cabling specification that details how customers can wire their buildings to pro-

vide voice and data outlets in offices. Although details concerning the outlet are sketchy, it is said to be compatible with AT&T's standard eight-pin information outlet and, on the other side, support interchangeable interfaces.

These interfaces will reportedly be compatible with some of the plugs specified in IBM's Cabling System and, when the standards are finalized, with the plug types specified with ISDN.

If the Universal Information Outlet lives up to rumors, it may signal a change of direction for AT&T, according to Patrick Gordon, director of data communications research at the Yankee Group, a Boston research firm.

The move would show that AT&T has recognized that the bulk of its business is going to be conducted in IBM shops, Gordon said.

#### **SWITCHES**

#### **Bytex busts matrix mold**

**BY PAM POWERS** 

Senior Editor

SOUTHBOROUGH, Mass. — Bytex Corp. last week introduced a second-generation matrix switch, the largest product of its kind and the company's first with a distributed architecture.

The Autoswitch 4000 boasts a

maximum 4,096 ports, twice as many as the largest switch available from Bytex's competitors. Matrix switches are typically used to spare front-end processors in critical data communications environments, switching lines to hot standby units in the event of a front-end processor failure.

See Switch page 53

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#### **INDUSTRY UPDATE**

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#### TELECOM TRENDS

TCA will see the introduction of a device that turns a PC into a full-motion videoconferencing workstation. **Page 15.** 

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#### **FACTORY COMMUNICATIONS**

Retix, a two-year-old start-up, gambles on OSI, wins, and inks OEM pacts with several industry heavyweights. **Page 25.** 

#### **COMMUNICATIONS MANAGER**

Network expert Robert Roy is meeting head-on the challenge of developing Harvard's long-range communications plan. Page 27.

#### NEW PRODUCTS AND SERVICES

At TCA, Tekelec will announce a network monitor and simulator designed for testing new network configurations. **Page 29.** 

#### **FEATURES**

State telecommunications policymakers are battling the FCC in court for greater control. **Page 41.** 

#### ► INTECOM

#### **Buyers challenge firm**

**BY NADINE WANDZILAK** 

ALLEN, Texas — Just six months after resolving one costly legal battle, Intecom, Inc. is facing new challenges from two buyers of its private branch exchange equip-

RTS Teleleasing Corp. of New York this month filed a \$5.9 million suit against Intecom, Wang Laboratories, Inc.'s newly acquired PBX subsidiary, claiming the TSX switches it bought from Intecom are "defective and useless." RTS is seeking \$5 million in punitive damages in addition to an award of at least \$900,000 for breach of contract, breach of warranty, fraud and breach of covenant of good faith and fair dealing.

Those same TSX switches were at the heart of an earlier lawsuit filed by American Network, Inc., which provides residential and commercial telecommunications service throughout the Western states. RTS leased the switches, which were installed in 1983 and 1984, to American Network.

In March, a federal court jury in Oregon returned a \$37.5 million verdict against Intecom for breach of contract, breach of warranty and fraud in the American Network case. Prior to the jury award, however, Intecom and American Network agreed to a settlement of roughly \$12 million. RTS Teleleasing referenced the jury award in the American Network case in its suit, filed in the same court.

See Intecom page 50

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#### ► CONTROLLERS

#### Lee Data unveils T-1 support

Product ties remote systems to IBM hosts.

**BY PAUL KORZENIOWSKI** 

Senior Editor

MINNEAPOLIS — Lee Data Corp. last week responded to its users' demands for faster response times with the introduction of a two-component product that links remote Lee controllers to IBM mainframes via T-1 lines. In addition to the T-1 product, the company announced its intention to add X.25 support to its controllers.

With the announcement, Lee becomes the first vendor to offer users the capability to tie remote controllers to a host over T-1 lines. Typically, remote controllers talk to a host through digital lines, which operate at 56K or 64K bit/sec.

A T-1 line usually is divided into 24 64K bit/sec channels, which can be used to transmit both voice and data. As announced, the Lee devices are geared principally for

data transmission.

Hughes Aircraft Co.'s Radar Systems Group in El Segundo, Calif., a beta site for the T-1 product, said it may use it to support a group of programmers housed at a remote office.

A drop in programmer productivity had been linked to slow response times at the remote site. In tests, the Lee product has speeded response time and improved productivity.

The Lee offering consists of two parts.

At the remote site, a Lee Data Interface Expander, which can support up to four Lee controllers, consolidates output lines from a controller or controllers and feeds information into a device with a T-1 interface, such as a modem. The device then hands the transmission over to the telephone company.

At the host site, Lee's T-1 Communications Processor takes the information from the telephone company line, packages the data and sends it over a block multiplexer channel to the host.

These channels typically support transmission speeds up to 27M bit/sec. Even though the T-1 Communications Processor can handle four T-1 lines, it cannot handle more than four remote controllers. This limitation stems from the number of logical units the device can support, according to the company.

If a user wanted to mix voice with data over a T-1 line, Lee said its offering could be integrated with most current T-1 multiplexers.

The company said it had successfully tested the product with equipment from General DataComm Industries, Inc., Datatel, Inc., Avanti Communications Corp., Racal-Milgo, Inc. and Scitec Corp.

Lee also said it would deliver X.25 support for its controllers next spring. The technique and price for the support have not been determined.

Lee may have stated its intention in response to moves by IBM and ITT Corp., both of which added X.25 support to their product line earlier this year.

Traditionally, Lee has been a technical innovator in the 3270 market and other vendors have followed its product lead, according to Ilene Goldman, an analyst with International Data Corp. (IDC), a Framingham, Mass., market research firm.

Despite the company's noteworthy achievements, Lee is only a minor player, ranked fifth, in the 3270 controller market, with less than a 5% market share, according to IDC.

The T-1 Communications Processor costs \$19,185, and the Interface Expander sells for \$1,500. Both products will be available later this year.  $\square$ 

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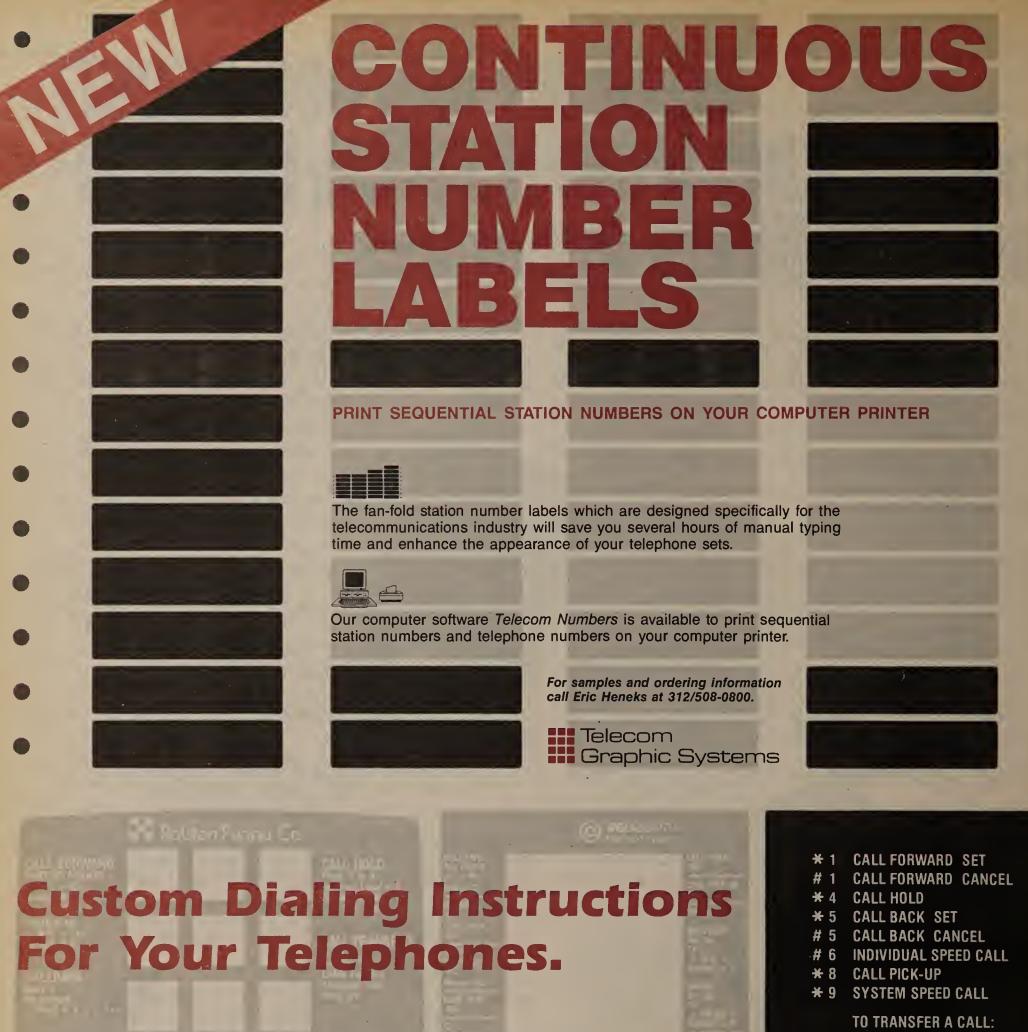
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#### LOW-END PBX

#### **Siemens' Saturn I bows**

BY JOHN DIX

Senior Editor

NEW YORK — Siemens Information Systems, the U.S. arm of one of the largest European communications equipment suppliers, followed the lead of prominent domestic switch makers with the introduction here last week of a low-end digital private branch exchange.

The Saturn I replaces Siemens' popular SD-192 two-wire analog switch. The company's line of digital switches now extends from the 24- to 242-line Saturn I up through the Saturn II, Saturn IIE and Saturn III, the largest switch, which supports up to 800 lines.

Introduction of the Saturn I throws Siemens into the middle of the hotly competitive low-end digital switch market. In recent months, Rolm Corp. jumped into the mart with the Redwood; AT&T followed suit with the announcement of the System 25; and Mitel Corp. capped the summer off with the introduction of a digital version of its SX-200 PBX.

The low-end market is the larg-

est single switch market, but it offers lower profit margins than the high-end market. According to Ian Angus, president of Angus Tele-Management Group, Inc., a consulting firm in Toronto, the big guns are being forced to focus on this segment owing to the saturation of the high-end market.

As delivered from the factory, a basic Saturn I can support as many as 128 ports. Addition of an expansion shelf adds support for another 96 ports. The switch is nonblocking for 224 ports.

The switch supports both standard analog telephones and Siemens' Dyad line of digital sets. The digital telephones, which are compatible with all Saturn switches, include the Jr. Dyad with eight programmable buttons, and larger 18- and 26-button models. The Dyad handsets provide single-button access to common features, such as call transfer.

The digital telephones do not, however, provide data support. Data terminal equipment is interfaced to the switch through separate devices called Data Communications Interfaces (DCI).

DCIs provide an RS-232 interface and support asynchronous data at speeds ranging from 50 to 19.2K bit/sec. Although analog and

digital telephones can be plugged into DCIs, the voice and data signals actually travel separate paths to the switch over individual twisted-pair wires.

The Saturn I features Universal Digital Interface line cards, which can support Dyads and DCIs interchangeably. Like the Dyad handsets, the Saturn I line cards are compatible with other switches in the Saturn line.

The Saturn I's least-cost routing enables customers to program up to eight time-of-day and day-of-week routing changes.

The Saturn I will be sold by distributors and ranges in price from \$400 to \$1,000 per line. Siemens Information Systems is based in Boca Raton, Fla. **Z** 

#### MAP/TOP MEET

## AT&T will build fiber MAP net

BY BOB WALLACE

Senior Writer

ANN ARBOR, Mich. — AT&T last week detailed its plan to become the first user to create a Manufacturing Automation Protocol factory network operating over fiber-optic cable.

At the MAP/Technical and Office Protocol Users Group meeting here, AT&T officials said Concord Communications, Inc. will supply AT&T with MAP-compatible products that will be used to hook AT&T processors and industrial workstations to lightwave cable on the factory floor of an unnamed manufacturing facility.

MAP is a set of emerging and established standards created to enable factory networkers to link products built by multiple vendors over a broadband, coaxial cablebased, token-passing bus network.

The current factory standard does not include any reference to fiber-optic cable as a transmission medium for MAP nets. Possibly in reaction to news of the AT&T/Concord Communications project, the MAP/TOP Users Group's Steering Committee formed a Fiber Specification Special Interest Group.

The group is charged with developing and recommending fiber-See **AT&T** page 52



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#### MAP products rain down

BY BOB WALLACE

Senior Writer

ANN ARBOR, Mich. — Vendors previously committed to support of the Manufacturing Automation Protocol made good on their promises last week, introducing a bevy of MAP products at the MAP/Technical and Office Protocol Users Group meeting here.

Both Data General Corp. and Hewlett-Packard Co. unveiled interface equipment that will enable users to link the companies' processors to MAP-compatible broadband factory networks.

DG's first foray into the MAP marketplace was made possible by a joint marketing pact with Allen-Bradley Co. Among the Allen-Brad-

ley products DG will resell is the VistaMAP network interface unit. DG spokes-

man Bruce Bendix claimed the devices will allow DG processors to be linked to broadband, backbone, MAP local-area nets. DG said it is

close to finalizing an OEM contract with Allen-Bradley that would allow the former to resell MAP-compatible broadband and carrier-band modems.

Allen Bradley will also work with the office automation systems vendor to develop a standard interface that will enable factory users to link DG processors to Allen-Bradley's Data Highway baseband

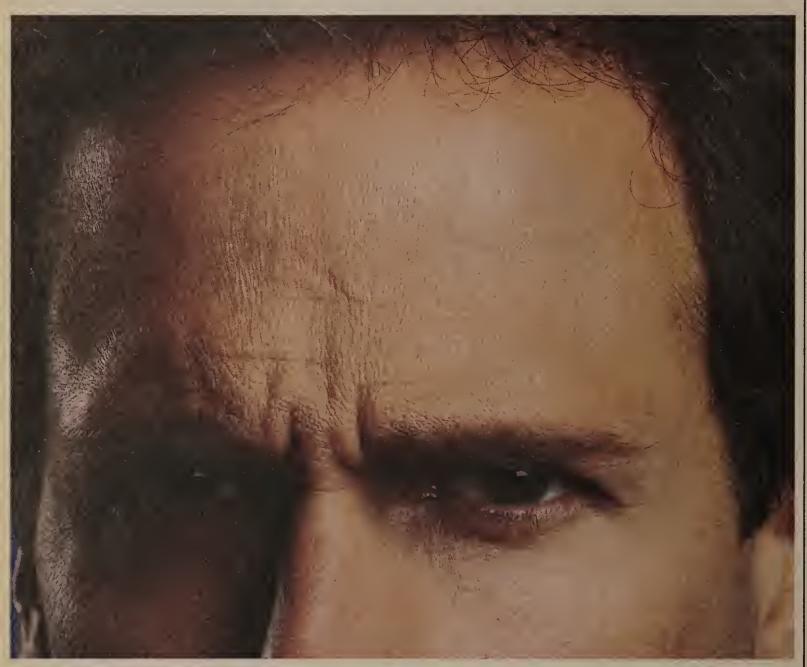
> Hewlett-Packdeveloped the interface that will enable factory users to link

its 1000A series computers to local nets compatible with MAP 2.1.

More news: page 50

Newly formed Concord Commu-

See MAP page 52



## "I want to know why the network is down. And I want to know now!"



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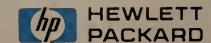
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#### LAN WORKSTATIONS

#### **Vendor trio** to build diskless PC

BY MARY PETROSKY

DALLAS — Hoping to expand the market for local-area networks, Orem, Utah-based Novell, Inc. last week entered an alliance with Santa Clara Systems, Inc. (SCS) and South Korea-based Hyundai Electronics to design and build a diskless personal computer that will sell for under \$600. The announcement was made during Novell's Networld exhibition here

Under the agreement, SCS of San Jose, Calif., will design an Intel Corp. 8088 microprocessor-based computer capable of automatically booting Novell's Netware network operating software from a server, said Darrell Evora, vice-president of marketing for SCS. Evora could not say what network interface would be built into the computer or how much memory it would have. He said the machine, slated for release before year end, would be the first in a series of diskless workstations to come out of the alliance. Hyundai will manufacture the workstation and market it along with SCS. Novell will aid in the development work.

By offering the low-cost local net attachment, SCS and the other alliance members hope to revive interest in the diskless workstation concept and spur local network installations. SCS has marketed a line of diskless workstations for three years. Its current 8088-based workstation sells for \$1,295. But that price has proven too high for many users since low-cost IBM Personal Computer-compatibles came into the market, Evora said.

Users contacted by Network World last week expressed interest in using diskless workstations on local nets, but some said they believe such products may meet resistance from end users.

Robert Tuttle, manager of technology assessment and planning for Kaiser Permanente Medical Care Program, Walnut Creek, Calif., is currently deciding which workstations will be used in his organiza-

"Diskless workstations have some real advantages, such as security, uniformity — because everybody has to run the same programs — and centralized storage and backup," Tuttle said.

Boeing Computer Services Co. is also evaluating diskless workstations, said Dave Mueller, network architecture manager for a company division in Renton, Wash. He agrees with Tuttle's assessment of the advantages of a diskless micro, but expects some users may not like them. "We'll probably get some resistance from users who'd prefer to have the entire data center on their 

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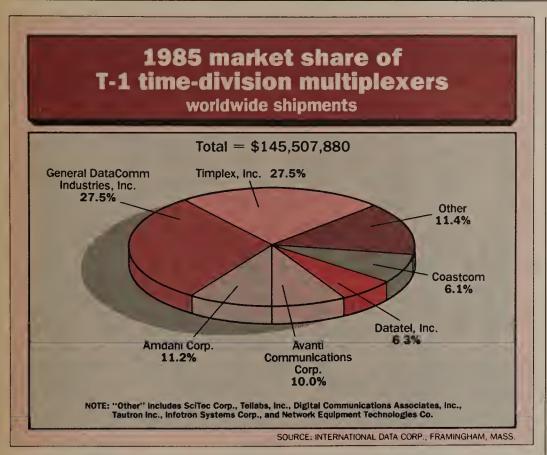
You can also use the form to make any necessary changes to your name and address.



## INDUSTRY UPDATE

#### Start-up to market T-1 wide-area nets

A former director at Wang Laboratories, Inc., Thomas Mercer, has started a new venture called Communications Equipment Corp. The company will manufacture and market a wide-area networking product incorporating voice and data over T-1 lines. The product will be similar to Network Equipment Technologies Co. and Network Switching Systems offerings, but according to a company spokesman, it will be more sophisticated and considerably less costly. Communications Equipment expects to introduce the product within the next two years.



#### EQUIPMENT STANDARDS

## Federal group will draft OSI purchase standards

CHICAGO — U.S. Commerce Secretary Malcolm Baldridge announced the formation of the Government Open Systems Interconnect Users Committee at the recent International Machine Tool Show.

The group will work toward developing standard specifications for OSI protocols. In the future, all government agencies will be expected to comply strictly with these protocols when purchasing equipment.

The group, which consists now of 15 governmental agencies, will determine which protocols will be implemented with which specifications and when. Since the U.S. government is perhaps the largest single computer user in the world, the

committee is expected to have considerable influence on the development of standards.

The effort is hosted by the National Bureau of Standards (NBS). According to Bob Blanc, director of computer systems engineering at NBS, the committee will use a two-pronged approach to the standards issue.

Within six months, the 15 government agencies will draw up OSI specifications for internal use. The specifications will be based on existing standards and existing implementations such as Manufacturing Automation Protocol and Technical and Office Protocol.

tions and when. Since the U.S. government is perhaps the largest single computer user in the world, the

At the same time, the Government OSI Users Committee will describe See **OSI** page 14

**▶** IBM

#### **Plan spurs retirement**

ARMONK, N.Y.— In an effort to slim down its work force, IBM last week announced early retirement benefits for domestic employees. The retirement incentive is one of a series of recent moves to reduce costs for IBM, which has a no-lay-off policy.

Eligibility for retirement is extended by adding five years to the age and service record of all employees as of Dec. 15, 1986. Those

volunteering for the program are to retire no later than June 30, 1987.

A combination of limited hiring and normal attrition are expected to reduce IBM's work force by 4,000 by the end of 1986.

A continued policy of limited hiring, in conjunction with the retirement incentive, is expected to reduce the work force by 8,000 in 1987. IBM listed 242,241 employees at the end of 1985.

ACQUISITION ANALYSIS

## General Signal grabs Telenex

Buy out braces young switch maker.

**BY PAM POWERS** 

Senior Editor

MOORESTOWN, N.J.— The acquisition of Telenex Corp. by General Signal Corp. is expected to give fledgling Telenex the financial boost it needs to penetrate the matrix switch industry market as a David among Goliaths.

General Signal recently bought up Telenex, based here, for an undisclosed sum. Founded in 1983 by several former executives of Northern Telecom, Inc.'s Spectron test equipment division, Telenex commenced operation with a line of datascopes, which are low-end network test equipment. Telenex's

Autoscope and Portascope product lines are currently the bread and butter of its business.

At Interface '86 in March, the company introduced the Autonex matrix switch, a device used for backup and restoral of central-site equipment. Autonex is based on circuit-switching technology and is targeted for mid-sized environments.

With its entrance to the matrix switch market, Telenex stepped into battle with some well-established and deep-pocketed vendors. Despite the fact that the product met with critical acclaim, the move was a decidedly risky one in an in-

See Telenex page 10

#### **INDUSTRY EYE**

PAM POWERS

## Industry moves show what's hot, what's not

66 PCI once

boasted the

lion's share

of the

protocol

converter

market. ??

ere's a maneuver that educes what's hot and what's not in the communications industry: Telematics International, Inc. of Fort Lauderdale, Fla., a manufacturer of mid-range and high-end packetswitching

equipment, is acquiring Protocol Computers, Inc. (PCI) of Woodland Hills, Calif., a maker of protocol converters and other equipment.

PCI has witnessed its own demise from its position as the profitable leader in protocol converter sales. Telematics, yet a callow youth

by industry standards, has forged into the packet-switching arena and built a healthy niche for itself.

PCI may profit handsomely

from the acquisition. In its heyday, PCI boasted the lion's share of the protocol converter market. Even today, with its flagging spirits, the company has an installed base of over 17,000 units. But in running the

race, PCI didn't look backwards until trouble was licking at its heels.

The protocol converter business has taken a nosedive in revears. cent Causal factors include the emergence of add-on boards for terminal emulation, severe price erosion and integration of

conversion function onto private branch exchanges and local-area networks.

In this shifting climate, PCI See **Telematics** page 14

**LABOR** 

### IBEW to vote again on N.E. Tel contract offer

BY NADINE WANDZILAK

Staff Writer

For the second time in two months, 20,000 members of the International Brotherhood of Electrical Workers (IBEW) are voting on a proposed contract with New England Telephone.

IBEW members have until Oct. 3 to vote on the new contract proposal, to which union officials and New England Telephone agreed

earlier this month after workers voted down an initial contract ("IBEW, BOC still at odds," *Network World*, Sept. 8).

"We have a tentative agreement with New England Telephone," said James Kiley, IBEW business manager of Local 2323 in Cranston, R.I.

"The company backed off on its concessionary demands," Kiley said, but it remained inflexible on the issue of contracting out tele-

phone pole work in Massachusetts and Rhode Island.

The union opposes contract work, so opposition to New England Telephone's proposal remains, Kiley said.

In contrast to IBEW's experience with New England Telephone, 1,700 IBEW members in New York ratified local contracts with New York Telephone Co. and the Nynex Information Resources Co. on the first go-round.

Voting on the contract ended last week. The IBEW/New York Telephone contract, which covers some 1,500 of those 1,700 IBEW members, "squeaked by" by 43 votes,

according to Linda Reynolds, president and business manager of IBEW Local 2213 in New York. 72

Telenex from page 9

dustry that is showing signs of consolidation. Telenex's product line is still incomplete, a point the company itself readily admits.

Telenex plans to offer a performance-measurement system as well as an expert system with automatic network restoral capabilities. These added pieces to Telenex's product puzzle will provide problem determination and fault diagnosis with automatic adjustment.

On its own, Telenex would have had difficulty funding internal development of such sophisticated products. General Signal's stronger cash profile may give Telenex the opportunity to develop the products it needs to compete successfully in the market. General Signal reported 1985 revenue of \$1.8 billion.

General Signal markets instrumentation and control systems for semiconductor production, telecommunications, industrial automation, energy management and rail transportation. The company recently reorganized to take better advantage of opportunities in communications.

Accordingly, it has shed some acquisitions and negotiated others with companies such as Telecommunications Technology, Inc. of Milpitas, Calif., a maker of test and alarm systems for telecommunica-

we look for
up-and-comers
in need of
help, whether
that be
financial or
strategic,' said
ReyesGuerra. ??

tions, and Tau-Tron, Inc. of Westford, Mass., which makes performance-measurement equipment for fiber optics and other media.

Jeff Kaplan, communications analyst with International Data Corp., a Framingham, Mass.-based market research firm, applauded the move.

"General Signal is trying to get deeper into the data processing environment," he said. "This is a good way to do it, because the Telenex matrix switch is cable-based, which fits into General Signal's approach."

According to David Reyes-Guerra, General Signal's manager of communications, "We look for up-and-comers in need of help, whether that be financial or strategic. But we grant a lot of autonomy to these units."

Telenex will keep its present management structure, as well as a network of six local and regional sales offices throughout the U.S. and in England.

## Announcing the Network Premiere of 24/24.



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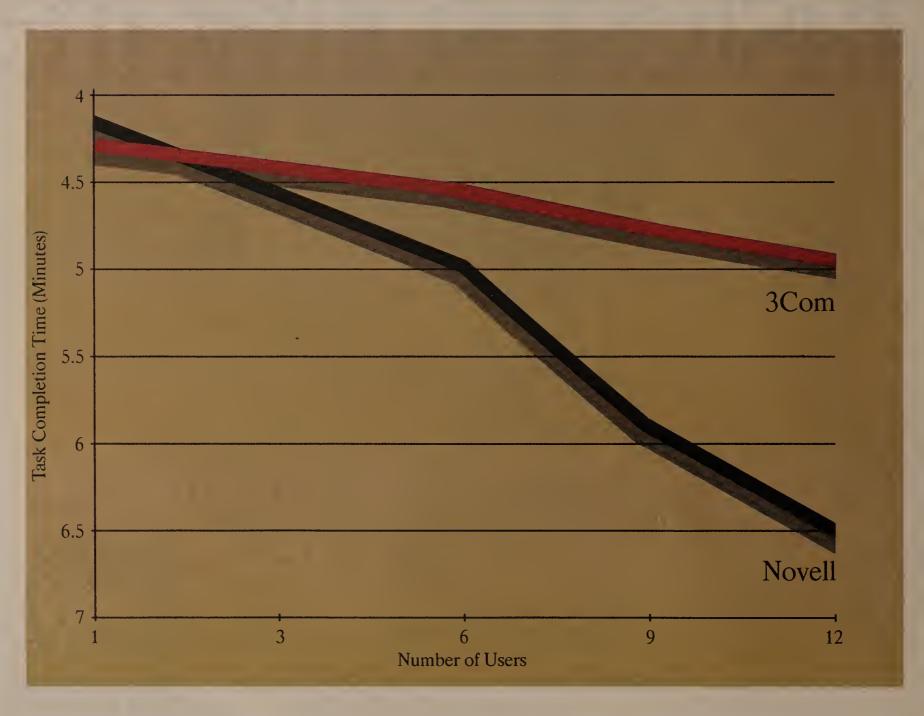
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Impartial proof that when the work is coming fast and furious, 3Com keeps you fast instead

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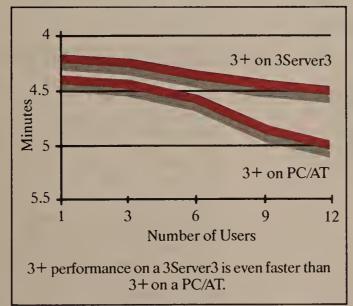
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**66** Plagued by disquieting rumors

about the company's health, potential

customers and distributors steered a

clear path around PCI. ??

#### Telematics from page 9

remained temporarily paralyzed. The company's box business migrated to board solutions. PCI retaliated with announcements of high-end box products, but the announcements were premature. Competitors dropped their prices. PCI followed suit, but not without shrinking profit margins.

Plagued by disquieting rumors about the company's health, potential customers and distributors steered a clear path around PCI, resulting in a protracted period of grisly financial results. Toward year end 1985, PCI rallied to develop and bring to market a series of products supporting IBM protocols and X.25. These emulation boards assembler/disasand packet

semblers were well-received, presenting to PCI the chance to rise like the phoenix out of the ashes. But moving into 1986, revenues were still flat at about \$8 million.

Realizing the limits of the lowend of the market, the company began to court potential suitors to avail itself of high-end products

and hence high-end customers. The search ended with Telematics, which has a strong profile in the packet-switch, backbone class network arena. Telematics brings with it a coterie of OEMs and systems integrators that will open up another distribution channel for PCI. The

match is mutually beneficial, pro-

viding each company an entree to new markets — Telematics gains sales at the access layer of the network, PCI at the backbone layer.

The packet-switching market is hot; the protocol convertor market is not. Had PCI not made this move, it would still be beating its head against the wall, trying to support an enormous user base on flimsy profits at the low end. Z

#### CONTRACTS

LOS ANGELES — Security Pacific National Bank last week awarded a contract to NCR Corp. for the development of a \$50 million "Branch of the Future" network. Upon completion, the joint project, spanning four years, will support 600 branches servicing over 2.5 million customers.

NCR was selected as the supplier, after a year of assessment, for a network that will fully automate Security Pacific's banking system. The plan will use more than 4,000 financial personal computers and other workstations. Terminals will assist customers through voice commands, graphics and live-action video. All bank tellers and branch officers will be equipped with advanced display terminals to speed transactions and customize documents.

According to Roy D. Hartmann, vice-chairman of Security Pacific, NCR's open system architecture and intelligent workstations will facilitate the development of a new banking technology. The NCR Tower XP, a computer operating under Unix, will serve as the hub for all data and transaction processing.

A pilot of NCR systems will run in five branch offices to determine the production level of hardware and software.

ROCKVILLE, Md. — American Satellite Co. (ASC), a wholly owned subsidiary of Contel Corp., last week announced the signing of a contract with the Defense Communications Agency for the replacement of its overseas Automatic Digital Network (Autodin). The 10-year contract is valued at more than \$75 million.

Autodin is a store-and-forward digital message-switching system used by the Department of Defense to link U.S. Armed Forces installations worldwide. ASC will replace existing government computers in the network with Digital Equipment Corp. VAX 11/785-based computer systems and Datram Worldwide 2000 Mass Memory Systems.

#### OSI from page 9

fine unique agency requirements, while working to influence developing standards to meet its specifications.

According to a spokesman for the Department of Commerce, the committee will work with the NBS Workshop for Implementors of OSI. This is a body of 200 users and vendors that sets parameters for protocols to build compatibility among vendor products. Z

WHEN IT COMES TO BUILDING WIDE-AREA NETWORKS, THERE'S NO SUBSTITUTÉ FOR EXPERIENCE.

While any number of companies can offer to sell you a private wide-area network, one company can offer you 25 years of computer and communications experience along with it. BBN Communications.

Experience that includes designing and building the world's first packet-switching network for the U.S. government back in 1969. Since then, it has evolved into the world's largest wide-area network, the Defense Data Network, connecting over 30,000 users throughout the world.

But the U.S. Government isn't the only customer with tough networking problems that BBN has helped to solve. Numerous major corporations, among them Wang, Weyerhaeuser, and MasterCard, not to mention European giants like England's National Westminster Bank and Italy's largest corporation, ENI, have also found the answers they were looking for from us. Each came to BBN with a unique networking problem-from integrated voice/ data transmission to electronic mail to credit authorization-and each came away with a unique networking solution.

If you're going to make a major commitment to a wide-area network vendor, only three things count. Experience, experience, and experience. In wide-area networking only one company delivers it all.

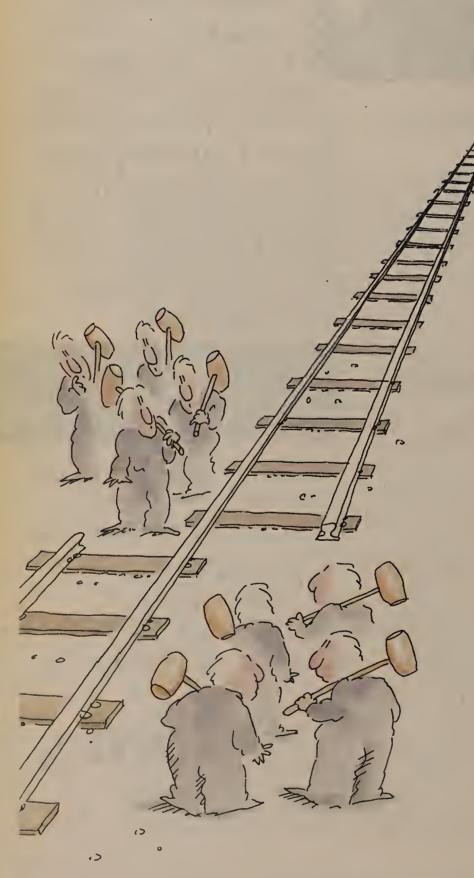
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## TELECOM TRENDS

#### **CIT-Alcatel lands its videotex over here**

Hoping to replicate the videotex success it has enjoyed in France, CIT-Alcatel, Inc. announced at the recent International Videotex Industry Exposition & Conference that it plans to begin actively marketing its E-10-Access Gateway in the U.S. Roughly 70 of the Gateways, with 35,000 ports, have been installed in France. The French system will support nearly three million terminals and 2,500 information service providers by the end of the year.

TCA CONFERENCE

#### Visionplus puts PCs in pictures

Product lets users see who's talking.

**BY JOHN DIX** 

Senior Editor

SAN DIEGO — A \$6,000 device that turns a personal computer into a full-motion videoconferencing workstation will be introduced here today at the Telecommunications Association's annual conference.

VisionPlus, the first offspring of Austin, Texas-based VideoTelecom Corp., is a video telephone that enables users to talk with and see other VisionPlus users. Workstations are interconnected locally with coaxial cable and can be networked with remote systems over dedicated fiber-optic cables at distances up to 12 miles or telephone company T-1 links.

VideoTelecom is a venture capi-

tal-backed, one-year-old start-up headed by President Lawrence Seligman. Seligman, a 20-year industry veteran, has held positions with Digital Equipment Corp., Data General Corp. and, most recently, Datapoint Corp.

Workstation components of VisionPlus include an add-on board for IBM Personal Computers and compatibles, a hand-held remote control device and a camera unit housing a speakerphone. Personal computers must have a minimum of 256K bytes of memory, a floppy disk drive, an IBM color display adapter and a full-color red, green and blue monitor. Seligman said the system was compatible with most graphic software packages.

In use, the VisionPlus monitor acts just as any other micro moni-



tor would until a videoconference is initiated. "You dial the person you want to talk to with your telephone, and if he has a videophone, his image will appear when he answers the phone," Seligman explained.

When conference calling, the callers can select the image displayed or set it to trail the conver-

sation automatically to show the person talking, Seligman said. VisionPlus is said to be compatible with existing teleconferencing equipment.

The system can transmit the images of both callers or screens generated by their personal computers.

Transmitted images can be printed

See Videophone page 18

CROSS TALK

**JOHN DIX** 

## Those who wait for ISDN may miss the boat

Trying to do communications planning with Integrated Services Digital Networks lurking on the horizon is like trying to bail out a sunken boat. The sea of jokes, hype and promises drown out all good intentions and obscure the reality of the concept.

But waiting for the arrival of ISDN is even more foolish than ignoring the option until it is available. This is particularly true when intracompany communications planning is involved.

While ISDN may affect the future of in-house data communications, waiting to see how it will do so ignores many of the connectivity problems plaguing so many companies.

A few observations can be made about ISDN's future role within the office. First, private branch exchanges that conform to the standard will play a larger role in office communications, particularly for casual workstation users who need access to different office systems or external information sources.

And second, ISDN specifications for data communications are low speed compared with local networks, 64K bit/sec

to the desktop as opposed to the 1M to 10M bit/sec operating speeds of most local networks.

Taken together, these observations indicate that ISDN will play some role in the future office but probably a small one.

The significance of ISDN's role will depend in large part on the evolution of the desktop workstation.

While 64K bit/sec pales next to 1M or 10M bit/sec, it's important to remember that ISDN is circuit switched, hence closer to actual throughput rates than the operating speeds quoted for the local networks.

And with today's personal computers, a 64K bit/sec circuit-switched channel is more than adequate for inquiry response, messaging, transmission of 10-to 20-page documents and other common applications typical of the casual user. That could change with workstation evolution and the growing importance of memory-intensive applications.

While food for thought, ISDN should be considered as a promise and should not obscure today's needs. **TELEMARKETING** 

## Voice service cuts marketing costs

Service may be useful for mass merchandising, sweepstakes.

BY JOHN DIX

Senior Editor

LOS ANGELES — A start-up company here hopes to remove the human element from telemarketing when it cuts over a service later this week that will enable callers to use their push-button telephones to interact directly with the company's computers.

U.S. Topper Ltd. will begin operation Sept. 26, when it turns on 300 AT&T 800 Service toll-free lines here at company headquarters. It plans to expand service with the addition of 50,000 more direct distance dialed AT&T lines to

be installed by the end of next year.

U.S. Topper is a subsidiary of United Development Industries, Inc., a company now controlled by the owners of U.S. Topper. Robert Christie, chief financial officer of U.S. Topper, said United Development was financially troubled before its merger with U.S. Topper. After the merger, U.S. Topper officials became the major shareholders of the holding company.

U.S. Topper is readying a service that its business clients will be able to use for mass merchandising, market share promotions, telemarketing and demographic-statistic gathering. According to company President Terry Jackson, another promising application is electronic sweepstakes. The service could be used to provide sweepstakes

See Telemarketing page 19

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ur customer testimonials would be vastly more effective here in this space than our claims about successful private networks.

But our customers don't want their networking successes publicized.

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Third: Unequalled *reliability*. Our technology, through designed-in, non-stop redundancy and an intelligent, self-healing network architecture means our customers' critical applications have *higher availability*—the true measure of reliability. We invite comparison.

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#### NORTHWESTERN BELL

#### Metro-area net to be tested

BY JOHN DIX

Senior Editor

ST. PAUL, Minn. — Northwestern Bell recently announced plans to test a fiber-optic metropolitan-area network in conjunction with 3M Corp. in an effort to explore high-speed switched digital service alternatives.

The test, scheduled to begin this December, is similar to one announced earlier this summer by Nynex Service Co. and Harvard University ("Prototype Bellcore net put to test," Network World, June 30).

Like the Nynex network, Northwestern Bell's metropolitan-area network test will initially be used to interconnect Ethernet-type local networks at 10M bit/sec, according to Thomas Freeberg, district manager of new services and operation systems planning for Northwestern Bell.

The network will be a star-wired token-passing ring network. While star in shape, legs of the single-mode fiber network will actually be lobes of a continuous loop, each lobe rooted to a hub controller at a Northwestern Bell central office switch facility.

Freeberg said the telephone company expects to be able to stretch network lobes across the St. Paul metropolitan area, a distance of roughly 50 miles.

This configuration — similar to IBM's Token-Ring Network — enables failed network nodes to be isolated by bypassing, at the hub, the lobe serving that node. The hub also provides Northwestern Bell access for management and billing functions. Northwestern Bell will provide, install, maintain and operate the equipment.

The end of each fiber leg will be terminated at 3M with a packet switch housed in space leased by the telephone company. That switch, to be supplied by Bell Communications Research, Inc., will provide an interface for IEEE 802.3 Ethernet-type local-area networks.

3M will meet the public net at the transceiver level and use the metropolitanarea network to interconnect Ethernet-type nets running Transmission Control Protocol/Internet Protocol, Freeberg said.

lnitial applications for the network will be bulk file transfer for computeraided design and manufacturing applications at 10M bit/sec.

Freeberg said he expects the network speed to be upped to 80M bit/sec in Phase 2 of the trial.

The idea for the network

field test was sparked by 3M. The company asked Northwestern Bell to propose a backbone network that it could use to interconnect local networks scattered through its 19-building complex here.

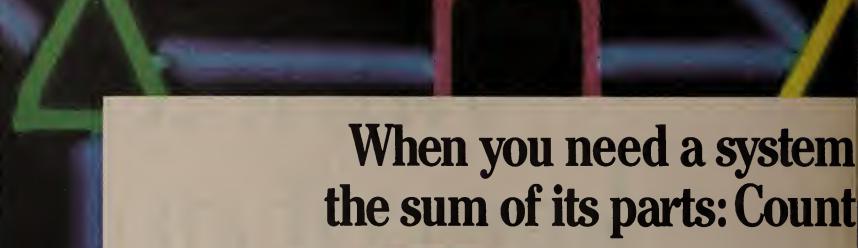
Freeberg said the trial may ultimately "fill a void in our product line in the area of high-speed switched digital service."

Although the company intends to use the technology to offer raw bandwidth to customers, it may also design specific services around the technology.

Northwestern Bell is a unit of US West, a Bell holding company. Z

Videophone from page 15 by the receiving party but not stored.

Audio support is provided by interfacing the workstation to the customer's telephone system. Video support is achieved by wiring the workstations in a star topology to a backroom device called a premise controller. The controller is a \$10,000 device capable of switching video



To maximize the availability of your data communications network today—especially multinode T1 networks—you need a system that's even greater than the sum of its parts. At GDC, we know it's not just one part, but every part working together that makes your network a success.

Putting that knowledge to practical use has made GDC the leader in megabit multiplexing, with the largest installed base of private T1 networking products. We have maintained our leadership position with MEGANET, the ultimate service for cost-effective networking and control. It's the only solution that adds products plus services to equal a total networking system. A system that offers the broadest, most compatible line of products with built-in flexibility that work together to fit your particular communications requirements; from sophisticated multiplexed or switched multi-node T1 networks, to simple local area access.

Even more importantly, MEGANET includes comprehensive service and support with extensive people management capabilities for installation and training. With MEGANET, it all adds up to a total networking solution you can count on.



Multiply your wide area networking capabilities. GDC's software-based MEGAMUX\* II,

a fourth-generation multiplexer, multiplies your multi-node T1 networking like never before.

It represents 10 years of GDC leadership in T1 multiplexing. It accommodates up to 16 aggregate links, with aggregate rates up to 2.048 Mbps. It includes an autoframe feature to maximize efficiency of bandwidth allocation in multiple node, multiple aggregate networks. It uses the same data and voice channel cards as GDC's MEGAMUX® PLUS and KILOMUX® PLUS multiplexers to provide flexible, compatible and cost-effective configuration. And it incorporates redundancy and diversity switching to ensure reliability, with preprogrammed alternate routing in case of line failure.

With three types of voice channels, plus centralized control and management via GDC's NETCON® Network Management System, MEGAMUX II is the next step to higher level networking.

Network flexibility that branches out to every area.

A truly flexible communications system extends

the reach of your network in every direction, including the latest technological developments in packet switching. With our GEN\*NET\* family of concentrators, and our GEN\* PAC X.25 PAD access devices, you have your own link to a packet-switched network. For high-speed, high-density applications, they offer the most economical, reliable way to connect geographically dispersed computers and terminals.

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lt's a fact that 75% of the major telecommunications carriers in North America have standardized on GDC data sets for

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images. One premise controller can support up to 100 VisionPlus terminals, depending on frequency of use. Each controller supports 22 simultaneous video calls.

Systems can be networked within a 12-mile radius using a separate fiber controller and dedicated fiberoptic cable. Seligman said one fiber, operating at the digital equivalent of rough-

ly 100M bit/sec, can carry three analog video signals.

Wide-area networking is possible with VisionPlus using T-1 digital telephone company facilities and separately procured video compression hardware. VideoTelecom has tested its system with equipment from Compression Labs, Inc. with good results. Seligman said the Compression Labs equipment squeezes a

video image into 768K bit/sec, roughly half the capacity of a 1.54M bit/sec T-1 link.

Compression equipment can range in price from \$70,000 to \$100,000.

The company said that a VisionPlus system including 10 workstations and a premise controller would cost \$69,000. System shipments are scheduled to begin in October. Z

**Telemarketing** from page 15 players with instant gratification, he said.

U.S. Topper is based on a relatively new technology called voice response. Calls are answered by a prerecorded voice, which walks callers through a logic tree, instructing them how to use their push-button telephones to interact with U.S. Topper's Digital Equipment Corp. computer system.

U.S. Topper would not disclose the vendor of the voice response system.

Callers will initially access the system through the company's 300 toll-free AT&T 800 lines. Next year, the company will establish an undetermined number of regional centers and provide access to these with 20,000 lines, which will be provided by AT&T by May 1, 1987. Another 30,000 AT&T lines are scheduled to be installed in December. These facilities will be networked to enable callers across the nation to access U.S. Topper with a local phone call.

#### Welcome, Republicans

As an example of U.S. Topper services, Christie cited a potential fund-raising application for the Republican National Committee. Callers responding to a fund-raising advertising campaign for the next presidential race may be greeted by the voice of lameduck President Ronald Reagan.

"Callers could be greeted by Reagan saying, 'Welcome, fellow Republicans. This is Ronald Reagan. I'm pleased to have you participate in this campaign,' and be walked through a twominute program asking them to touch the buttons on their telephones to accomplish certain things," Christie explained.

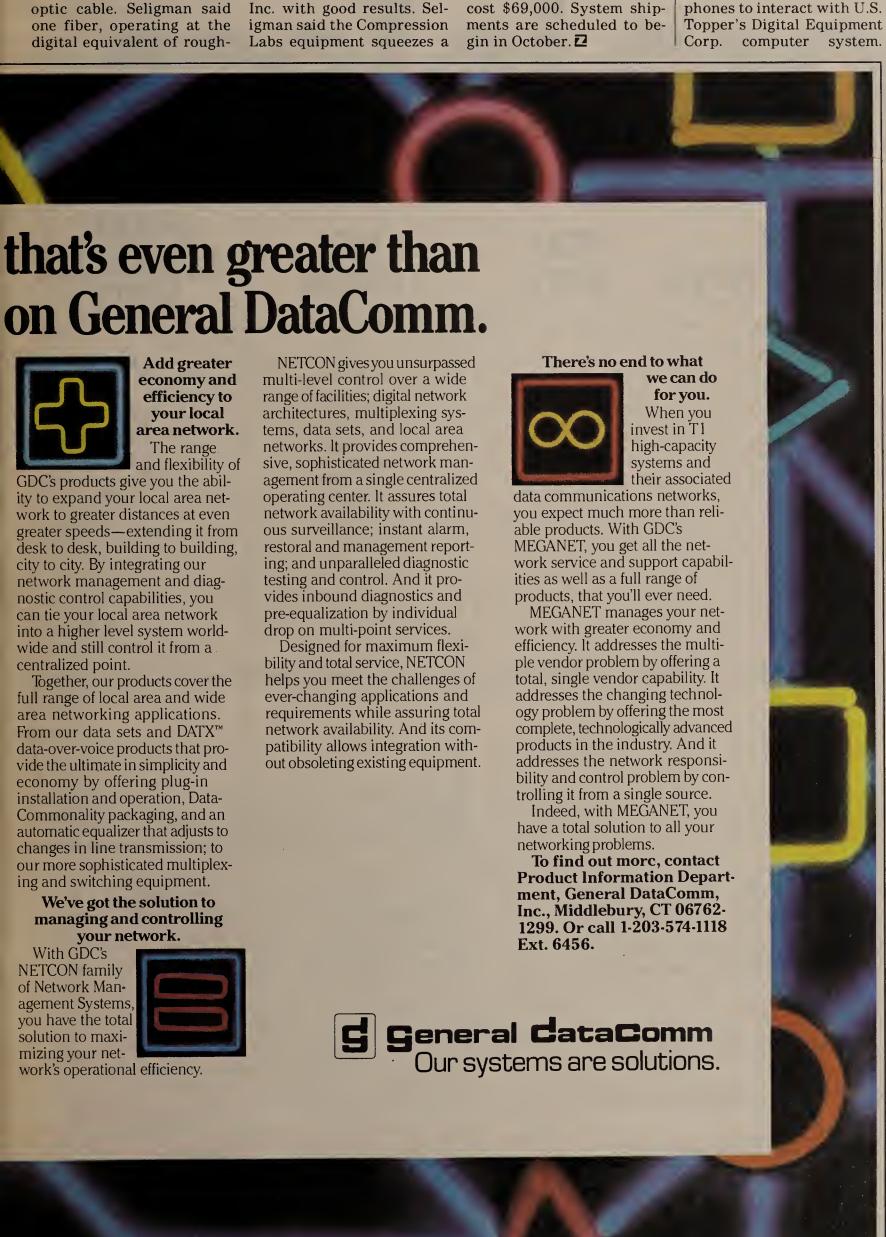
The fund-raising business is one of several markets that could benefit from the low cost-per-transaction feature of the service, he said

In fund-raising, Christie claimed, the service would give clients a larger return per dollar of donation than operator-staffed telemarketing campaigns.

In many fund-raising drives, donations of \$10 or less are washed out by operating expenses, Christie said. U.S. Topper's service may make \$2 donations beneficial, providing donation drives with newfound revenue.

The results of television or print media marketing campaigns that solicit response via the U.S. Topper service will be tallied by the company and transmitted electronically to the client. When used for order entry or in other instances where the caller would have an identification, the company can pass the transaction onto the client within four hours, Christie said.

Turnaround time in applications involving first-time or one-time callers is 24 hours. U.S. Topper charges clients a fee for each telephone call.  $\square$ 



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COMMUNICATIONS SERVICES VIA



**66** The microcomputer-to-mainframe link vendors are partly responsible for the current industry slowdown. They promised users easy access to mainframe data and then didn't deliver.

Rudolf Strob! Senior consultant Arthur D. Little Co. Cambridge, Mass.

> ATM NETWORKS

## Tandem beats up on Big Blue

Banks find faults with IBM offerings, but foresee product enhancements.

BY PAUL KORZENIOWSKI

Automated teller machine (ATM) networks are causing some big headaches for IBM. Analysts report that in users' evaluations of processors for networking ATMs, IBM systems are being beaten out in as many as four of every five cases by products from Tandem Computers, Inc.

The task of ensuring that ATM nets remain up and running at all times is proving a difficult one for IBM. ATM networks require lightning-quick response times and 100% uptime. Tandem manufactures a line of fault-tolerant processors, which are systems equipped with redundant components. For example, if the CPU breaks down,

the device will switch to a spare CPU.

The products' redundant capabilities are a key selling point at companies with ATM networks. "We don't want our network to be down at all," noted Steven Van-Fleet, vice-president of operations at Financial Interchange, Inc. in Houston. "From time to time, an IBM mainframe will go down."

In June, the company, which processes 4 million transactions a month, chose a Tandem system for its network and plans to migrate from an IBM 3081 mainframe to the new system by the second quarter of next year.

In addition to its products' features, Tandem is carving out a healthy niche in the ATM market because relatively few companies — less than half a dozen — compete against each other.

One of those vendors is IBM, which offers users three alternatives. ATM software can be run on an IBM mainframe, but this strategy leaves users without muchneeded redundancy capabilities.

In addition, the company offers its Transaction Processing Facility (TPF) software, which was developed for the airline industry more than a dozen years ago. A couple of years ago, IBM fine-tuned the product and began offering it to a broader range of users. Financial institutions are a key target of the new marketing effort.

Even though TPF is good at handling large volumes of transactions, users are hampered by its complexity. "Companies have a difficult time finding qualified personnel to run a TPF network," noted L. David Passmore, group manager at Network Strategies, Inc., a Fairfax, Va., consulting firm. Because TPF runs only on an IBM mainframe, the product is also expensive.

IBM's third offering, the System 88 fault-tolerant processor, is manufactured by Tandem's chief competitor, Stratus Computer, Inc. of Natick, Mass. A main problem with this device is that it does not run the most popular ATM software. A.O. Smith Data Systems, Inc. in

See ATM page 23

#### ► TECHNOLOGY

#### Modems may trip up 800 lines

Autoanswer bogs down hunt groups.

BY ROBERT J. KELLY

Special to Network World

Incorporating the latest modem innovations may actually cost, rather than save, users money. Autoanswer modems have been gaining popularity and have found homes in most large corporations. Users who mix and match these modems with existing services supplied by the telephone company may find themselves unwittingly paying for unused lines and may encounter difficulty in pinpointing defective modems.

Telephone company hunt groups, equipment that supports a number of telephone lines with a single telephone number, represent one problem area. Hunt groups are used with toll-free 800 numbers.

When a potential customer dials an 800 number, telephone company equipment searches for an unused telephone line within the hunt group.

When an empty line is found, the equipment connects an incoming caller to that line and processes the

Autoanswer modems may be connected to the receiving end of a hunt group line when the lines are used to transmit data. Before a connection is made, the computer uses an RS-232 connection to send a data terminal ready signal to a modem. This signal notifies the modem that the computer is ready to accept data

A call may be sent by the hunt group to the line with the modem. Since the data terminal ready signal has been set, the modem answers the telephone call. The receiving modem next sends an answer-back tone to the sending modem.

If the modems are compatible, then both modems bring up the carrier-detect lead on the RS-232 interface. This completes the handshaking routine, and data can be transmitted.

#### Potential problems

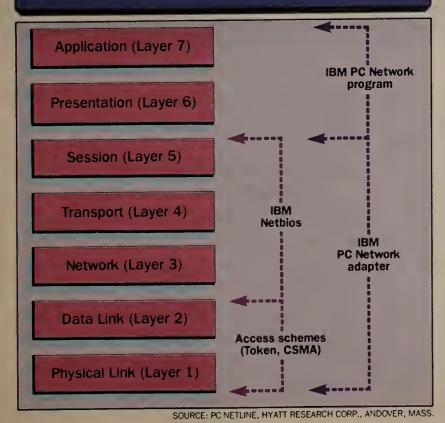
However, clear connection cannot always be established. A problem often arises when the receiving modem does not respond to See **Modems** page 22

DATA DIALOGUE

ERIC H. KILLORIN

#### Can Netbios take the system and run?

#### How IBM's PC Network MAPs to OSI relationships



BM's success with the Personal Computer is attributed, in part, to its use of an open architecture, which encouraged third-party application developers to write programs for the device's Basic I/O System (Bios), the underlying set of instructions that enable the machine to function. This strategy resulted in tremendous growth in the microcomputer marketplace as well as a spate of

So it is not surprising that IBM followed a similar approach with the PC Network, its broadband local-area network that links microcomputers. The PC Network incorporates Network Basic I/O System (Netbios), a communications interface between the PC Network Adapter card and PC-DOS. Hoping to foster support for its network, IBM made Netbios an open architecture interface and operating system-independent. Software developers are able to write PC Network applications without having to write to a spe-

Eric H. Killorin is the publisher of PC Netline, a newsletter on microcomputer networks, and president of Hyatt Research Corp., a communications market research firm in Andover, Mass.

See Netbios page 22

#### Netbios from page 21

cific Network Interface Unit (NIU), which controls the network.

Netbios corresponds to the session (Layer 5), transport (Layer 4), and network (Layer 3) layers of the International Standards Organization's Open Systems Interconnect network model. The session layer interprets networking commands and establishes a communications session by mapping user-chosen names to network addresses. The transport layer creates a point-topoint connection between two NIUs on a network and handles flow control. Finally, the network layer handles switching and routing of packets on the network.

As a high-level interface, Netbios defines the method and format used to interface to network communications mechanisms. Because of its support for general services, Netbios can accommodate a variety of local-area networks using different media, signaling, topologies and access schemes.

Netbios cleanly separates the individual features and complexities of different vendors' networking implementations from a given personal computer's operating system. Just as IBM Personal Computer-compatible vendors emulated Bios to achieve nearly perfect compatibility, networking vendors can achieve PC Network compatibility by emulating Netbios.

Each layer of the NIU's protocol software is limited to interacting with the layers directly above and below it. For example, when transmitting data, messages are passed from the personal computer's interface software to the top layer of Netbios. This layer adds control information and passes the packet down to the next layer for further controls, until the message is sent over a cable.

Conversely, in receiving data, the physical layer receives a signal and then reads and interprets control information inserted by the corresponding layers of the transmitting unit. The packet is then passed up to the next layer, which continues the process up to the session layer. The session layer then delivers the original data to communications software in the destination personal computer.

Netbios receives commands, which control an NIU on the network, in the form of Network Control Blocks (NCB). A command block is issued by interrupting the NIU and pointing to the command block.

NCBs are divided into four categories: general, name support, session support and datagram support commands. The following describes what each one does:

- General commands allow the NIU to read status or control other commands.
- Name support commands allow users to choose logical names for their personal computers on the network, rather than using numbers for their network address. The name can be a unique one or a group name on the network. A permanent, unique name is required for each NIU.
- Session support commands allow

the user to establish a logical connection on the network, send and receive messages, disconnect and read session status.

■ Datagram support commands allow users to send and receive a message to or from a name, a group name or all users on the network. Datagrams differ from sessions in that they are never acknowledged by the receiver's NIU and they are less reliable transmissions than are session commands.

So far, IBM's strategy of releasing the Netbios specification is working. Several vendors have introduced products that support Netbios, including Fox Research, Inc., Banyan Systems, Inc., Hayes Microcomputer Products, Inc. and Novell, Inc.

But doubts linger about the longevity of this interface, and this will cause some software developers to rethink their positions. One reason is that IBM will be placing most of its emphasis on LU 6.2, also known as Advanced Program-to-Program Communications, a software interface that provides peer-to-peer communications for devices connected on a Token-Ring Network.

Although Netbios can run on the Token-Ring, the real question is: Is it necessary to have two communications interfaces?

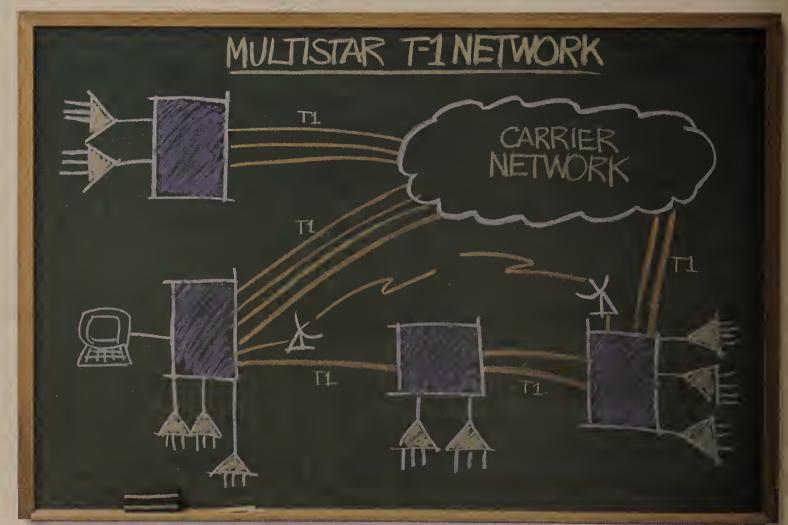
In a world where users are demanding less complexity in managing their corporate networks, it is likely that only one interface will survive.

#### Modems from page 21

a ring. For example, there may be 32 modems in a group. A call comes in and the hunting equipment starts at Telephone Line 1 and searches upward for an empty line. Let's assume that Lines 1, 2 and 3 are busy and Line 4 is not. The hunt group equipment will skip Lines 1, 2 and 3, then attempt to connect to the receiving modem attached to Line 4.

If Modem 4 is not working, the sending modem will ring anyway. However, the modem will never answer, and eventually the user has to hang up the incoming call and try again. When Modem 4 is ringing, other incoming calls skip Line 4 and search for an empty line, usually higher up in the group. When

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frustrated user hangs up, the line to Modem 4 is once again free. The next caller will unsuccessfully try to connect to use that line.

A second problem can occur when modems stay connected even though the incoming caller has disconnected and the computer has instructed the modem to disconnect.

Testing all lines in a hunt group is a difficult and tedious chore. Each line in a group has to be connected until all lines in the group are busy. A test can be performed by obtaining all the telephone numbers in the hunt group from the phone company and dialing each number instead of calling the main number. This type of testing also has problems. If the number dialed is malfunctioning or busy, the tele-

phone company equipment may automatically connect to the next number in the group. The test may not uncover any Ring, No Answer problems. For this type of problem, a person must examine each modem to determine which modem is ring-

ing and not answering.

Malfunctioning connections are costly in many ways. First, they force modems and computer ports to be idle. More importantly, users are being inconvenienced, often for long periods of time. Technicians

handle only problems brought to their attention.

In addition, hunt group lines are usually connected to expensive 800 numbers. When lines are not working, the number of calls that can be processed is reduced, and the service may not be cost-effective.

Fortunately, modem-monitoring equipment to solve this problem is becoming available. Some of this equipment extracts information and detects the problems described here. These devices have reporting capabilities and can help users solve problems associated with autoanswer modems.  $\square$ 

Kelly is president of Communications Devices, Inc., a Clifton, N.J., communications vendor.

\*\*Costly in many ways. First, they force modems and computer ports to be idle. More importantly, users are being inconvenienced. \*\*?

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#### ATM from page 21

Brown Deer, Wis., manufactures software that runs on an IBM mainframe or a Tandem system. The company does not yet offer a version for Stratus' system.

Perkin-Elmer Corp. and NCR Corp. also make hardware designed to handle ATM transactions. Perkin-Elmer's offering does not handle large volumes of transactions well. NCR's products are untested because they are recent announcements, according to Passmore.

Despite Tandem's growing momentum, it has not been a clear-cut winner for every ATM network. Since 1981, First City Bank Corp. of Texas in Houston has been using an IBM mainframe and software from A.O. Smith to run its ATM network.

The company has gradually tuned its network so that it overcame IBM's biggest bugaboo. "We've enhanced our network so that it stays up and running 99.5% of the time," noted Louis Ivey, senior vice-president at the bank, which processes more than 4.5 million transactions per month.

Tandem devices can be run in conjunction with IBM mainframes and TPF, and many large banks use both Tandem systems and IBM's TPF. In this type of configuration, the Tandem system cannot perform sophisticated routing capabilities.

Running in an IBM Systems Network Architecture network, a Tandem Nonstop system has to be designated as a Physical Unit 2.0 device, a designation typically reserved for unsophisticated network devices such as an IBM 3274 controller.

To perform sophisticated routing functions, a device would have to act like a Physical Unit 5.0 device (for example, an IBM front-end processor). Tandem has told some of its large customers that it will overcome this obstacle sometime next year.

During that time, IBM is expected to enhance its offerings and make them more palatable to financial organizations. "Tandem seems to be ahead of the pack right now," said David Fenstemaker, vice-president at First Interstate Services Co., a bank in Irvine, Calif. "But once IBM puts all its pieces in place, such as LU 6.2, it may be able to regain the lead in the ATM market."

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## FACTORY COMMUNICATIONS

#### **Netware 2.0a unwrapped**

Novell, Inc. of Orem, Utah, recently announced Advanced Netware 2.0a, which will reportedly support Allen-Bradley Co.'s Vista/LAN PC. The updated network operating system is available immediately.

PROFILE

### Retix cashing in on OSI

BY BOB WALLACE Senior Writer

tergraph Corp.

SANTA MONICA, Calif. — What began two years ago as a handful of software engineers mulling the future of office and factory floor networks has evolved into a \$3 million Manufacturing Automation Protocol software company that has signed OEM agreements with the likes of Prime Computer, Inc., Micom-Interlan, Inc., Advanced Computer Communications Co. and In-

Retix, a start-up company based here, licenses software that supports individual communications protocols or suites of protocols. A manufacturer wishing to acquire software from Retix could license a single protocol of a multiple protocol standard, such as layer 3 of the seven-layer Open Systems Interconnect (OSI) network reference model, or it could license all seven layers

In late 1984, company President Andy De Mari and a band of ten software engineers left Compucorp, a Santa Monica, Calif.-based office automation firm. Later, fifteen additional Compucorp workers joined De Mari to found the start-up.

A gamble on OSI

"We looked at the networking market and decided that if we developed products like network bridges and routers that connect networks that didn't exist at that time, we would surely go out of business," he recalled.

"We sensed a growing interest in OSI, so we decided to gamble our entire company on the future of OSI."

The gamble paid off. Retix amassed \$700,000 in revenue by the end of 1985, its first year of operation. De Mari shoehorned the company's administrative, product design and manufacturing workers into a 6,000-square-foot building.

The company, which now boasts a staff of 35 and a new 27,000-square-foot corporate headquarters, recently completed a round of venture financing that netted

roughly \$1 million. Retix plans to announce several more OEM deals in upcoming months and has already set out to initiate relationships with the largest computer equipment producers in Europe. Retix has been peddling abroad what De Mari calls "the PTT stack."

Retix has begun negotiations with a large software company in the UK and with an equally large software producer in West Germany. Retix hopes to provide these two companies with exclusive rights to license the three-protocol Post Telegraph and Telephone Administration stack to companies in their respective nations.

Retix has also introduced a hub for AT&T Starlan networks and is working to develop a gateway that would link IBM Systems Network Architecture nets to OSI-based systems.

Retix recently joined the Corporation for Open Systems (COS), a user/vendor association that advocates the production of computers and networking equipment that in-

corporate OSI protocols.

**Negotiations with Concord** 

Retix is also negotiating with Concord Communications, Inc., formerly a division of Concord Data Systems, Inc., to provide the factory network manufacturer with the upper layer protocols of the seven-layer MAP specification that it currently lacks. The company has also joined forces to provide Industrial Technology Institute (ITI) with factory network testing tools. ITI, based in Ann Arbor, Mich., is a nonprofit group that tests factory nets to determine if they are compatible with MAP specifications.

De Mari said Retix will announce individual availability of the three components that make up its X.400 protocol later this fall. Software that includes the CCITT messaging standard will be popular with private branch exchange and computer vendors, and electronic mail system suppliers, De Mari predicted.

De Mari calculated 70% of the company's \$3 million expected revenue for 1986 will be derived from its software licenses. The remaining 30% will be generated by sales of such network hardware as the Starlan hub. The leader of the start-up firm forecasted this software to hardware sales ratio will balance out in 1987. Z

FACTORY FACTS

**BOB WALLACE** 

#### A user-oriented, no-bull MAP forecast

ou can't always believe what you read, especially if what you are reading is a study that predicts the Manufacturing Automation Protocol equipment marketplace will explode in the next three years.

Several market research and consulting firms have produced just such reports on the nascent MAP equipment market in the past year.

At least one of the studies, which General Motors liberally quotes in its MAP literature, projects the market will expand to roughly half a billion dollars by 1990.

The question that users and companies considering producing MAP-compatible products should ask these research houses is: "Are these figures based on information solicited from users?" In many cases, the figures given are dubious at best. Market research firms have a bad habit of asking vendors for market growth projections on which to base their study data.

One fledgling market research group has attempted to reverse this dangerous trend. Advanced Manufacturing Research (AMR), an industrial automation and integration consulting firm in Chicago, bases its factory market figures on user feedback.

AMR's figures are far smaller than those trumpeted by other factory research firms in their MAP studies. Anthony Friscia, managing partner of AMR, claims sales of MAP-compatible equipment will reach \$23 million to \$25 million by year end. He estimated that the equipment sold to GM for its three-plant Truck and Bus project will account for roughly \$7 million of the overall figure. Thus, one user, the nation's largest, represents almost one-third of the entire MAP product sales total this

Friscia argued that total sales of MAP products — a category that includes products that are only partially compatible with the factory communications

specification — will be \$50 million next year. He contended a large portion of MAP product sales in 1987 will comprise all the small MAP pilot networks that manufacturers may install to experiment with the evolving technology.

IBM's recent announcement of a MAP starter kit should boost sales of these MAP networking packages.

\$75m in MAP gear sales

Friscia, a former International Data Corp. and Yankee Group market researcher/analyst, forecasted total sales of MAP gear will reach \$75 million to \$100 million by year end 1988. The market is expected to expand dramatically in 1989, he added.

Friscia said users who have adopted a wait-and-see policy on MAP may begin to implement MAP pilot networks, while users pleased with ongoing tests may attempt to move the technology to production applications in their manufacturing facilities.

#### **INCIDENTALS**

"JIT — A Practical Approach to Materials Management," a program for managers interested in Just-in-Time management methods, will be held Oct. 15 and 16 in New York; Nov. 6 and 7 in Chicago; and Dec. 8 and 9 in Atlanta. The course is sponsored by the American Management Association's (AMA) Manufacturing Council. For information, call AMA at (518) 891-0065.

The Society of Manufacturing Engineers (SME) is sponsoring a seminar, "Simulation and Computer Graphics for Robotics: Design Tools for Effective Applications," Oct. 28 to 30 in Atlanta. Representatives from six companies will conduct hands-on demonstration sessions of their simulation and graphics packages used to design and program robotic work cells for manufacturing processes. For more information, contact SME at (313) 271-0039.

The Industrial Technology Institute and SME have developed the "MAP/TOP Product Directory" to provide current information on MAP/TOP-compatible products and leading vendors. Those interested in subscribing should call SME at (313) 271-1500.

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## COMMUNICATIONS MANAGER

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Charles Kahn

Consultant to management training and communications
Orlando, Fla.

NETWORK PLANNING

## Strategy dean calls long-range shots

Harvard's Robert Roy hunts down ways to connect old systems and set up new applications.

BY MARGIE SEMILOF

Senior Writer

CAMBRIDGE, Mass. — Developing a longrange strategic communications plan is something of an impossible dream for many organizations. But when the organization has vast intellectual resources and is as willing to experiment with networks as Harvard University, the planning process can be an invigorating challenge

Robert Roy, network and planning manager at Harvard, was looking for just such a challenge when he came to the university last year. Following an 11-year stint with New England Telephone, he was brought on board by Morris Murphy, a former business associate and Harvard's current communications director of the Telecommunications Services Division.

Roy's job is to help Harvard develop a networking strategy that will support the current Harvard community, incorporate existing equipment and services and be flexible enough to meet the university's changing communications needs.

"The decision to leave New England Telephone was difficult because people consider phone company jobs to be a lifetime career," said Roy, who comes from a family of lifelong phone company employees. "But it's important to enjoy what you're doing. I was in one position for three years. You either keep moving or you get stale."

Murphy was building a communications team to hammer out an overall networking strategy for the university. He called upon Roy to work with network users throughout Harvard in an effort to determine their future needs. Roy was also tagged to assist in the development of a network architecture and to present all plans to the university directors.

The existing departmental networks on campus are the responsibility of managers at each site. For this reason, Roy said, decision making will remain decentralized, although the new strategic plan will encompass all of Harvard's communications needs.

The plan must also accommodate Harvard's



considerable investment in existing data communications networks. "We are not trying to build a network that will displace existing networks," he said. "No one network will solve everyone's problems. We are addressing other issues, such as connecting those networks and developing new applications such as electronic mail."

See Roy page 28

#### GUIDELINES

MARGIE SEMILOF

#### Breaking up with AT&T is hard to do

communications manager with a network plan and plenty of executive support is way ahead of the game. After all, there are still plenty of companies, large and small, paying tremendous costs to hold hands with AT&T because they refuse to face the challenges of the postdivestiture communications environment.

One data communications manager at a large agricultural products company illustrates that point. He recently called *Network World* to voice his frustrations and learn whether there are other managers whose companies have done absolutely nothing to take advantage of alternative carriers and new technology.

The manager's company boasts an annual revenue of approximately \$800 million and a staff of more than 2,500. It has locations throughout North

America and Europe and ships its products worldwide. Voice and data communications responsibilities are managed separately. Responsibility for things such as data circuits, modems, multiplexers and private branch exchanges is further divided within each department.

"When divestiture hit, we simply clung to AT&T," the manager said. "No one on staff understood regulatory issues.

At the time, the decision to stick with AT&T seemed to mean the difference between the company surviving or falling flat on its face.

"However, I now realize there is a huge market for additional capabilities, long-haul and intra-Lata carriers we never considered," he added. "We weren't aware of options because there wasn't anyone here who understood divestiture."

The manager says his compa-

ny pays through the nose to stick with AT&T on every product and service. "AT&T tells us what to do," he said. "We do it and pay. Now I realize there may be less expensive ways of configuring data circuits, for example. We weren't aware of them, and AT&T sure doesn't tell us about them."

The manager says his company spends approximately \$1.5 million per year on data communications and between \$3 million and \$4 million on telecommunications. "I expect we could lop off a million from the combined total," he adds.

"On the data side alone, we could save between 24% and 40% of that total."

The company hired a telecommunications manager about five years ago. The individual had a solid technical background from many years with the phone com-

See Breaking page 28

#### PEOPLE

Terri Toenisson was appointed financial analyst for LiTel Telecommunications Corp. Toenisson was most recently a controller with Scherer Investments, Inc.

(P)

Vernon Lizakowski was presented NCR Corp.'s Laureate Award for continuing achievements in research and development

Lizakowski, an NCR Comten, Inc. software consultant, is the fourth person to have received the Laureate since the program began in 1982.

#### Wanted:

If you are a recently promoted communications manager or if a member of your technical staff has changed positions within the communications department, Network World would like to hear from you. Please send your name, new title and information describing your present and former position to Network World, 375 Cochituate Road, Box 9171, Framingham, Mass. 01701.

#### Roy from page 27

To form the building blocks of a strategic plan, Roy relies on the collective expertise of other communications staff members in the Telecommunications Services Division and the Office of Information Technology, the university's umbrella organization for technical services.

He also consults regularly with members of the university's Telecommunications Advisory Group, which is made up of people designated by deans and faculty at Harvard to represent departmental communications interests. Final recommendations are designed to be flexible enough to incorporate any emerging standards or communications requirements for at least the next two to five years, Roy

said.

"There are some steps we can take today and some steps that have to be postponed until we can gather more information," Roy added. "We can move ahead with our wiring plans, but some changes involving higher level network services will have to wait until we can be sure what communications standards will carry into the future.

"We take great pains to identify each step in the long-range planning effort," he said.

"It's a very deliberate process. We began developing the plan a year ago and are only about two-thirds finished."

Harvard currently has an eclectic mix of services for voice and data. One 7.000-line. New England

Telephone Centrex system serves the university's administrative staff, and another 4,800-line system serves the student population exclusively. There is also a variety of data networks, including at least one Sytek, Inc. broadband localarea network and one fiber-optic Ethernet that acts as a backbone to connect a number of other Ethernets.

#### Some enhanced services

Roy said his network strategy is to provide basic service with some enhanced services. "We would like to redefine basic service as something other than rotary dial."

Some of Roy's recommendations included the provision of a centralized voice service that will allow

some users to have a measure of local control. He has also suggested building a backbone-type network to accommodate tasks that cannot be performed by a private branch exchange.

This so-called higher level network would contain certain published standards. Users can choose their communications tools based on their ability to connect to this central backbone. Final product choices will be determined, in part, by the results of the request-for-proposal process, he said.

#### **Future needs**

Roy must continually assess the future communications needs of the Harvard community by conducting studies. Although he gathers as much information as possible from end users, Roy said there is always risk in choosing one technology over another.

"But we try to use as much information as possible to keep those risks down," he said. Z

#### Breaking from page 27

pany but left the job shortly thereafter. Hiring a consultant was out of the question, the manager says. "Even though [an outsider] may have helped, senior management had a small-town attitude about bringing in outside help."

The technical staff at the company consists of one data communications manager who reports to a field engineer with no communications experience. There are two data communications technicians responsible for equipment installation. "There is no central communications coordination at the company," he says. In addition, there are four analysts and a voice manager who handle PBX programming and oversee the installation of new equipment — all tasks done hand in hand with AT&T.

The manager knows that some monumental technical and personnel changes will have to take place if his company is serious about using communications to gain a competitive edge. He says he is mounting a single-handed attack on the company's communications problems from the "dollar perspective." He plans to begin shopping for other data circuit carriers and has purchased a software package that breaks down alternate carrier charges for data lines.

"If I can reduce our costs by 15%," he says, "I will gain credibility with senior management. Maybe they will look into what I am doing."

"Unfortunately, management must realize we need more skilled staff and must begin addressing the merging of our voice and data departments," he adds. "The company resists hiring experienced people because they command higher salaries."

The undaunted manager knows he has a formidable job ahead of him, but views each obstacle as a personal challenge. "My ideas may cost more in the short term, but in the long run I expect to save money and achieve some personal benefit too." 2



Nobody knows networking like Gandalf

## NEW PRODUCTS AND SERVICES

See inside for:

- ► Portable terminal and remote controller
- ▶ Fiber-optic modem

TCA NEWS

#### Tekelec to offer net aid

Tool boasts a myriad of testing capabilities.

BY JIM BROWN New Products Editor

SAN DIEGO — Tekelec, Inc. is expected to introduce a network simulator, analyzer and monitor at the Telecommunications Association show, which starts here today.

The Calabasas, Calif.-based firm said it will introduce the Chameleon 32 unit, which, according to director of marketing Robert Hess, was designed to aid network technicians in large organizations.

The unit is not designed for ongoing network monitoring. Rather, it is aimed at responding to network problems and testing new network configurations. Users can program the machine to begin recording data or to track certain events when specific error conditions occur.

In its current configuration, the Chameleon 32 comes with an RS-232 port to monitor one data channel at up to 19.2K bit/sec for protocol and data integrity, response time and message sizes. Optionally, the unit supports monitoring of either one 56K bit/sec channel or one 64K bit/sec channel by directly connecting to the Primary Rate Interface used in some early Integrated Services Digital Network-type offerings.

'We anticipate the unit will ex-



pand to four-channel monitoring by the first quarter of next year," Hess said. The multiport version, he added, will support simultaneous tracking of the signaling and transmission channels of ISDNtype services.

The device connects to either data lines feeding a front-end processor, a modem or a protocol converter for network analysis and monitoring. It can also simulate a front-end processor and mainframe in a network configuration testing environment. In simulation mode, the unit interprets data and protocols being fed from a protocol converter or communications controller and performs 87 tests to assure integrity.

The unit decodes X.25, High-Level Data Link Control, Systems Net-

Architecture/Synchronous Data Link Control, as well as Binary Synchronous Communications or asynchronous protocols into English phrases an operator can understand. "What we do is decode protocol commands into English so that somebody who is familiar with the protocol can chart what is happening in the progression of the protocol rather than having to spend their time translating," Hess said. The unit is also capable of decoding the Link Access Procedure for the D signaling channel, the Level 2 definition for ISDN signal-

The header fields of up to 15 screens are concurrently displayed on a Sony Trinitron 64-color, nineinch internal display monitor. Us-

See Tekelec page 33

ELECTRONIC MAIL

## ITT connects telex to major office systems

Bridge spans public, private E-mail.

**BY NADINE WANDZILAK** 

Staff Writer

SECAUCUS, N.J. — ITT World Communications, Inc. last week announced a new service designed to bridge public and private electronic mail systems.

Worldbridge, an enhancement of the company's current data bridge service, enables telex messages to be sent and received by popular office computer systems, including: Wang Laboratories, Inc.'s VS minicomputer, Digital Equipment Corp.'s VAX, Hewlett-Packard Co.'s HP-3000 and IBM's System/34, System/36, System/38, 5520 and Personal Computers. The service is also said to be available to IBM Disoss users

Using Worldbrage software, a Wang VS user, for example, could send a message to a DEC-based electronic mail system without complicated access procedures, ITT claimed. The company's message-handling service switches mes-

sages among the worldwide telex network, private data networks and office automation systems.

To send a message, a user inputs the destination name and address and ITT software, which resides on the office system, then formats and transmits the information to the ITT network for distribution. The message is delivered by telex or electronic mail.

Worldbridge supports most major protocols, including IBM 2780, 3270, 3780, Systems Network Architecture/Synchronous Data Link Control and 201 Safe, a banking protocol, at speeds of 50 to 9.6K bit/sec over dedicated or dial-up lines.

Software prices vary from around \$1,000 to \$20,000, based on the host computer system. To access telex, users pay only the standard telex access charge. 2

MICRO-TO-MINI

## **Board ties local nets to VAXes**

DEC mini becomes a PC net file server.

BERKELEY, Calif. — An expansion board tying local-area networks to Digital Equipment Corp. VAX minicomputers was unveiled recently by Virtual Microsystems, Inc.

The firm's Network Co-Processor board plugs into DEC VAX Unibus or Q-bus expansion ports. It supports access to the VAX from any Microsoft Corp. MS-Net-compatible local net using IBM's Network Basic I/O System protocols. In essence, the product turns the VAX into a file and print server for personal computers attached to a local-area network.

The package also includes a 10-slot expansion box compatible with the IBM Personal Computer AT model bus. The expansion box supports interface cards for Ethernet, Token-Ring and Starlan networks, including those made by 3Com Corp., IBM, AT&T and Ungermann-Bass, Inc. The box will also support up to six half-height devices such as floppy disk, hard disk and streaming tape drives.

The Network Co-Processor is driven by an Intel Corp. 80286 microprocessor with 1M byte of memory. The board manages network traffic processing and passes network requests to store or retrieve data to the VAX system processor.

Virtual Microsystems said it also offers VAX-resident software that allows personal computer users to store files in personal computer formats in a VAX virtual disk. Another software option offered by the firm translates personal computer files to VAX file format when a VMS-supported device requests access to the file.

Used with the firm's V-Drive product, the Network Co-Processor makes a network-connected personal computer appear to the VAX as a VT 220 terminal.

Virtual Microsystems said the product is fully Decnet-compatible, allowing any personal computer to access data on any VAX connected over a Decnet.

Pricing for the Unibus version of the Network Co-Processor, which will be available Oct. 1, starts at \$11,000. The Q-Bus version will be available Nov. 1, with prices starting at \$6,000. \(\overline{\over



# SOMETHING BRILLIANT JUST HAPPENED TO DATA TRANSMISSION.

Introducing Public Data Network\* from the Bell Atlantic Network Services Group. A startling communications development that's just made other interactive data transmission modes seem all but obsolete.

Packet Switching goes public.

Public Data Network offers the benefits of packet switching—through the telephone network—at speeds up to 9600 bps. By batching data into electronic "packets," Public Data Network is ideal for "bursty" applications like order entry, billing, information processing, credit approval, reservations, ticket sales and claims.

Suddenly, there's a more efficient way to move data.

Our Public Data Network is, without a doubt, the most efficient way to move interactive data. Period. What's more, rates are usage-based—dramatically lower than dedicated line costs.

Introducing automatic protocol conversion.

And because Public Data Network supports X.25 and asynchronous protocols, it's the perfect link between dissimilar data processing equipment. Like office and home computer terminals and multiple data bases. It also opens the door for electronic banking and electronic shopping and a long list of other interactive electronic subscription services.

A host of advanced network solutions.
In addition to Public Data Network, the
Bell Atlantic Network Services Group provides

an array of customized services to precisely match your communications needs.

From voice circuits to a variety of digital data services including High Capacity Digital Service and fiber-optic-based High Capacity Lightwave Service, we offer full duplex dedicated and switched digital data transmission at speeds ranging from 300 bps to 560 megabits. On a point-to-point or multi-point basis.

We're the customized network services experts.

Without optimized network transmission capabilities, your communications system is handicapped. That's where we come in. By applying our most valuable asset—our network expertise—we can unlock your system's potential, adding value through increased operating efficiency.

Contact your Account Executive, or call toll-free 1 800 843-2255, extension 14.



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#### Products 2 Services

Informer Computer Terminals, Inc. introduced its System 300 Subsystem, a portable terminal and remote controller that emulates devices used by an IBM System/34, System/36

or System/38 mini.

Portable terminal

The System 300, which consists of two parts, directly attaches to an IBM minicomputer and supports terminal functions such as status line, field separation and keyboard emulation. The two- to seven-port 291 twinaxial controller attaches directly to an IBM minicomputer.

Up to seven Informer 251 terminals can then be connected using either RS-232 lines or the device's integral modem. The terminal features a 9-in. display. An optional 212A/V.22bis integral modem operates at 1,200 or 2,400 bit/sec.

The standard 251 terminal with V.22bis modem

sells for \$2,190. A 291 twinaxial controller with two ports is \$2,545.

A typical System 300 with a 291 controller and three 251 terminals with integral modems lists for \$11,270.

Informer Computer Terminals, Inc., 22936 Mill Creek Road, Laguna Hills,

Calif. 92653 (714) 855-3112.

#### Portable workstation

**Informer Computer Terminals, Inc.'s** portable workstation, the **208**, connects to an IBM 3270 communications network.

The product emulates an IBM 3274 Model 51C controller and a 3179 color terminal. The 208 supports IBM 3276 System Network Architecture/Synchronous Data Link Control (SNA/SDLC) or Binary Synchronous Communications (BSC) protocols.

The product supplies a 9in. display and has an optional asynchronous adapter port. The device works with RS-232-C or dial-up lines and supports any of six integral modem options.

A standard 208 sells for \$2,995. With an optional V.22bis integral modem, the product sells for \$3,595.

Informer Computer Terminals, Inc., 22936 Mill Creek Road, Laguna Hills, Calif. 92653 (714) 855-3112.

#### PC-adapter module

Informer Computer Terminals, Inc.'s PC-adapter module connects an IBM Personal Computer to an IBM mainframe or a Digital Equipment Corp. computer system.

The Informer 211 supplies IBM 3178, 3276, 3101 or 5251 terminal emulation. The device can also mimic a DEC VT 100 terminal. Users can switch between terminal emulation and personal computer modes with a single keystroke.

Pricing for the 211 starts at \$995.

Informer Computer Terminals, Inc., 22936 Mill Creek Road, Laguna Hills, Calif. 92653 (714) 855-3112.

#### Fiber-optic modem

**Honeywell, Inc.** announced a fiber-optic modem that works with IBM 5251 and compatible cluster controllers.

Honeywell claims the HFM5300 modem restricts errors to fewer than one per one billion data bits transmitted.

Using 50-, 62.5-, 85- or 100-micron diameter fiber-optic cable, the modem provides a data communications link of up to 1,524

## Responsible for connection, monitoring and control of data communications networks?

Try this network quiz.

Does your present network allow interconnection of <u>all</u> your data devices?

Yes No

Is your user interface simple enough and management info complete enough that the "HELP" phone is rarely needed?

,

Yes No

Is performance—throughput and resource usage—at optimum levels?

Yes No

4.

Can you add devices without a network SYSGEN?

Yes No

Is your current network architecture an "open" one that prepares you for the current move toward standardization?

Yes No

If you've come up with a "No" or two, you'd best look into Vitalink's TransLAN.

Because TransLAN is your key to:

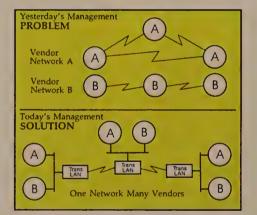
#### Simplified LAN interconnection and vendor independence

TransLAN lets you simply and cost-effectively link individual LANs into a single, coherent and geographically unlimited data network.

A true ISO Link Layer Bridge, TrańsLAN extends IEEE 802 protocols into a Wide Area Network. Because all stations appear to be local, any LAN station can communicate with other like stations on the bridged network. TransLAN also automatically learns the address of each station, filters out local traffic within the resident LAN, and forwards across the bridge only communications to and from remote destinations. Among the benefits, of course, are easier user interfacing to the network and simplified network management.

#### The elimination of geographic barriers

TransLAN interfaces with microwave, fiber-optic, satellite, dedicated and switched telephone (voice and data) circuits. And automatically builds the most efficient communications pathways.



Because geography becomes irrelevant—and the TransLAN bridge is transparent to each station on the system—you've ended forever the typical awkwardness of LAN interconnection.

#### "SYSGEN-less" network changes

Beyond easy assembly, TransLAN bridged networks offer automatic adaptation to new network configurations—no SYSGEN needed. That streamlines alterations, rearrangement of station locations and adding of new stations. The resulting simplified management is enhanced by your ability to easily acquire statistics, diagnose problems and gain insight into each

network location—from any network point.

#### Proven operation, proven price/performance

TransLAN is no experiment. It's at work in hundreds of locations worldwide. Supporting all Ethernet or IEEE 802 compatible products with throughputs in excess of 1500 packet/sec. Allowing incompatible devices to use the same network. Actually providing remote communication capabilities to any two similar devices able to communicate on a single LAN.

Obviously, you'll want to know more about how TransLAN can put a "Yes" answer on each question above. Call the TransLAN Support Staff today or send this ad and your business card to:



DuoType filename:5506Translan; Disk: F-7 Four Color Graphics; Palacio; 7-3-86sm (7-3-86; jp) meters or 5,000 feet. The modem plugs directly into the controller through a SMA 905/906 or SFR connector.

The HFM5300 modem is priced at \$1,010.

Honeywell, Inc., Optoelectronics Division, 830 E. Arapaho Road, Richardson, Texas 75081 (800) 367-6786.

#### Netpath upgrade

Pathway Design, Inc. has released Version 2.0 of its NetPath SNA-3270 terminal emulation product that serves as a local-area network gateway.

The device uses IBM's Systems Network Architecture protocol and formats to transmit data between a local-area network and a host mainframe computer.

Version 2.0 of the device allows personal computer users on the network to download data from the host system, process the data locally without losing the host connection and then return the data to the host.

The product is available in 8-, 16- and 32-session versions.

The enhanced product makes it possible to access multiple IBM hosts by installing multiple gateways on the local net. The device allows more than one gateway to be set up on a single personal computer.

The 8-session unit costs \$2,595, the 16-session unit is \$3,595 and the 32-session unit is \$4,595.

Pathway Design, Inc., P.O. Box 8179, One Apple Hill, Natick, Mass. 01760 (617) 237-7722.

#### Board-based access security

**Sperry Corp.** announced an expansion board offering new security

#### Tekelec from page 29

ers can select a total view of any one of the screens. An Intel Corp. 80186 microprocessor with 512K of random-access memory (RAM) processes the real-time monitoring screen updates.

Listing for \$21,500, the Chameleon 32 includes a keyboard and a three-expansion-slot mother board driven by a 10-MHz Motorola, Inc. 68010 microprocessor with 1M byte of RAM. It also comes with a 20M-byte hard disk, an 800K 3.5-inch floppy disk drive and an eight-slot expansion chassis wrapped inside a portable carrying case. An Intel Corp. 8085 microprocessor plucks data off the line and stores it in a 144K-byte capture buffer.

The unit operates under Tekelec's Multitasking Real-Time Operating System (M-TOS) in a multibus architecture and comes with a suite of analysis and monitoring software. It also features a built-in VT-100 terminal emulation function. Add-ons include V.35, V.36 and X.21 and T-1 interface ports.  $\square$ 

#### Products 2 Services

features for its personal computerto-mainframe terminal emulation package.

The Step Security Feature provides a special connector containing preset identification codes. The Step software checks the preset codes and approves host access only if there is an identification match. The Step package supports communications between personal computers and Sperry mainframes.

The Step Security expansion board costs \$500.

Sperry also announced a \$524 Enhanced Graphics Controller and an \$849 16-color Enhanced Graphics Monitor with 640-by-350 dot resolution. Both graphics products are compatible with IBM's Enhanced Graphics Adapter standards. The firm also introduced a 69M-byte hard disk drive listing for \$2,650 and a 117M-byte hard disk drive costing \$5,495. The disk drives are designed for the Sperry PC/IT personal computer.

Sperry Corp., P.O. Box 500, Mail Station B-200, Blue Bell, Pa. 19424 (215) 542-4213.

Fast polling modem

Prentice Corp. has announced a

9.6K'bit/sec modem aimed at multipoint networks.

The P-9600FP fast polling modem offers full-duplex synchronous operation over multipoint private lines and can be used in a point-to-point configuration as a V.29 modem. In multipoint configurations, the P-9600FP reportedly supports an 8-msec request to send/clear to send delay. The device also features fallback rates of 7.2K bit/sec and 4.8K bit/sec and local and remote diagnostics.

The P-9600FP costs \$1,995.

Prentice Corp., P.O. Box 3544, 266 Caspian Drive, Sunnyvale, Calif. 94088 (408) 734-9810. 72

Announcing
THE MARKETPLACE,
Network World's new section
covering the secondary market.

THE MARKETPLACE premieres September 22. For details on Charter Offers, Call Gina Ciampa toll free at 800-343-6474 (617-879-0700 in MA).

### NETWORK WORLD

The Weekly for Leading Users of Communications Products & Services.

375 Cochituate Road, Box 9171 Framingham, MA 01701-9171

### Opinions

#### EDITORIAL

**BRUCE HOARD, EDITOR** 

Chronicling the software saga

Sharp-eyed industry watchers and users alike have taken notice of the increasing sophistication of communications software and the expanded role software now plays in networking. In large measure, the communications software you choose today will define the network you use tomorrow.

Mindful of the difficult choices facing users, *Network World* is redoubling its editorial coverage of communications software. Starting on Page 1 of this issue with the story on private branch exchange management software, we're kicking off our intensified software coverage.

Perhaps you've already noticed the special logo that we tagged the PBX story with, a logo that also appears above this editorial. You'll be seeing a lot more of that logo between now and Dec. 15, when we cap off Phase One of our enhanced software coverage with a blockbuster Special Issue dedicated to detailing the depth and diversity of communications software.

Normally, in our Product Focus articles, we key on a single category and examine specific products from various vendors. However, there is such a great array of communications software

product categories, we think they must be addressed en masse before they can be broken down for individual scrutiny.

That being the case, we have decided to structure our Dec. 15 Special Issue differently. We won't be looking at individual companies and their products. Instead, we will feature, in chart form, the many important software categories and the groupwide features that comprise them.

And there's more. In that Spe-



we'll define the exploding communications software market in text as well as with charts. There will be

as well as with charts. There will be in-depth feature stories on custom software development services, software do's

and don'ts and industry-specific software.

We'll carry the momentum of the Special Issue forward into Phase Two of our intensified communications software coverage. Beginning in January, we'll be individually addressing each of the categories found in the Special Issue in our features section.

Throughout 1987, you'll be reading about the crucial communications software technologies and services that concern the

networking decisions you must make. And, of course, Network World's news coverage will continue to keep you abreast of the latest developments in the software world. Between now and Dec. 15, you can expect plenty of other communications software features, including a micro-to-mainframe Special Section on Nov. 3. Our Product Focus articles covering baseband local-area networks and communications processors on Oct. 20 and Nov. 17, respectively, will also emphasize software options and opportunities.

You can help make our software coverage even more meaningful by letting us know how you're buying, implementing and using software. We want to write about what you, the users, are doing, so that other users can learn from your experiences. Please call me anytime at 1-800-343-6474 ext. 332 with your software story. Your input is invaluable.

Help us chronicle the saga of communications software.

#### IMAGE TRANSMISSION

JEFFREY ROTHFEDER

## Getting the picture over long-haul lines

Image processing techniques have been growing more sophisticated, while prices have plummeted over the last two years. The next step toward wider acceptance of this technology is to develop a method for transmitting images over long distances. Soon, this rapidly emerging new technology may produce an office where optically stored images can be sent between cities with ease.

Image processing technology uses high-speed, high-density scanning devices to read paper and computer records and laser-controlled optical disks to hold nearly 100,000 documents. Insurance companies, banks, government defense contractors and federal intelligence agencies, which are saddled with reams of documents during the normal course of business, are the first industries to embrace image processing as a way to overcome their endless paper chase.

With these types of organizations as a backbone, the user base of this new technology has quickly ballooned from about 50 at the middle of last year to nearly 4,000 today, according to Dataquest, Inc., a market research firm based in Palo Alto, Calif.

But there's an essential link missing from optical image processing: long-distance com-

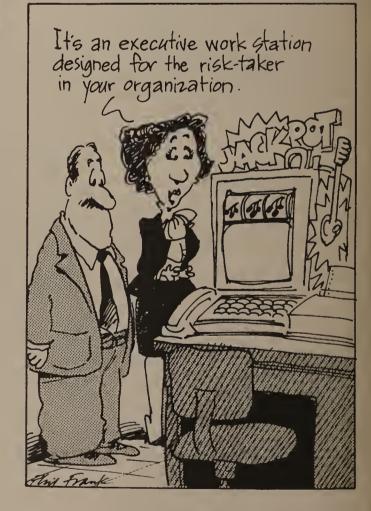
Rothfeder is a free-lance writer based in Wyckoff, N.J.

munications capability. "Using today's equipment setups, there's simply no way to transfer optically stored data over anything but shorthaul, intracampus communications lines," says Richard D. Schwartz, a former analyst at E.F. Hutton and Company, Inc., who now consults on image processing venture capital deals. "Interestingly, there are no real technical problems to surmount to achieve a long-distance transfer of data, but there's a fair amount of software that has to be written to allow users to understand how to retrieve data for sending, how to then get the data into the right form and finally how to send it."

Analysts think that until image processed data can be moved over long-haul lines, the technology will not achieve its potential. Essential customer capabilities (such as archiving documents in remote locations, sending prototype blueprints from headquarters to factory and moving encoded intelligence reports between operative sites) await the next level of image processing capabilities.

The future, though, may be here sooner than many think. If the innovative minds at General Electric Co.'s Nuclear Engineering Business Operations in San Jose, Calif. reach their goals during the next few weeks, the first transcontinental data junket of image processed information — from the firm's massive San Jose campus to its Wilmington, N.C., factory — will

#### ► TELETOONS — By Phil Frank



occur.

GE will ship scads of current and archived blueprints and reports that concern prototype equipment on the drawing boards. These documents, originally either hand-drawn or computer-generated on computer-aided design systems, have been scanned with image processing equipment, digitized and then compressed at a 30:1 ratio from E-size (engineering-size graphics that are 34 by 44 in.) and re-

See Transmission page 44

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# Opinions

New England Telephone's increased specialaccess rates, which took effect on Aug. 13, 1986, and New York Special to Network World Telephone Co.'s

request for a similar increase are justified because they address a significant revenue shortfall.

New England Telephone increases, about 19% over previous rates, address, in part, a revenue shortfall the company had been experiencing in providing the ser-

Prior to Federal Communications Commission approval, New England Telephone was earning less than half the FCC-authorized earnings of 12.75% on special-access net investment. In dollar figures, New England Telephone's shortfall exceeded \$17 million between October 1985 and April 1986.

Company projections submitted to the FCC also indicate that if the previous rates were to remain in effect, the estimated additional revenue shortfall for the 51/4 months left in the tariff enforcement period would exceed \$10 million.

Clearly, immediate rate adjustments were needed to relieve the earnings shortfall and send appropriate economic pricing signals to the marketplace.

Although the new rates raise the company's interstate rate-ofreturn level closer to the authorized 12.75% for this service, it is a virtual certainty that special-access services will still show a revenue deficiency for the overall life of the tariff.

In filing on June 24, 1986, for a mid-course correction in these rates, New England Telephone provided the FCC with seven months of data on actual expenses and revenues associated with the

The data demonstrated that the demand for special-access services, while not decreasing, had not reached the levels forecast in New England Telephone's original July 2, 1985, tariff filing.

In addition, the company told the FCC that its revenue shortfall also stems from the fact that actual expenses of providing the service were greater than those forecast in the original filing on July 2, 1985. This was due, in part, to updated interstate relationships introduced in the separations process in September 1985.

Essentially, the separations process is a method that has been agreed to by the FCC and local state regulators in order to separate a company's regulated costs into interstate and intrastate jurisdictions. Regulators will allow

Shepherd, a manager at New England Telephone, specializes in access services pricing.

costs through tariffed rates in their respective jurisdictions interstate or in-

telephone utili-

ties to recover

those separated

trastate.

This data resulted in higher costs being allocated to interstate services provided by New England Telephone, which include special-access.

Arguments that New England Telephone should have submitted a full 12 months of expense and revenue data for this mid-course correction are not valid. The correction sought by the company was designed to address an ongo-

Are the recent Bell operating companies' creases in interstate special-access rates (private-line

loops) justified? Although the Federal Communications Commission has allowed the BOCs to implement major rate increases for special-access service, the answer to this question is clearly and unequivocally no.

Since June 1986, Pacific Northwest Bell has increased its interstate special-access rates by 31% in Oregon; Bell Atlantic Corp.'s are up 29% in the District of Columbia, 12% in Pennsylvania and 9% in West Virginia; New York

BY JAMES S. BLASZAK

Special to Network World

BOCs do not support their claims. New England Telephone and New York Telephone increases illustrate serious deficiencies in the BOCs' argument. Part of New England Telephone's justification was that its special-access operating costs were 13% higher than forecast; however, demand for its specialaccess service was substantially less than forecast, and inflation was minimal. The latter two factors should operate to reduce New England Telephone's special-access operating costs.

Can any business other than a monopoly raise its prices with impunity at a time when market demand is declining? When the defor gasoline commodities falls and supply has not contracted, prices fall. They

do not go up by 20%.

There is another highly questionable aspect of the New England Telephone and New York Telephone mid-course corrections. Both carriers failed to reduce their special-access revenue requirements (costs plus return) in the face of declining demand, even though FCC rules require that special-access revenue requirements be based on demand for the service. Put simply, a shortfall in special-access demand must result in a lower special-access revenue requirement.

But then why did the FCC permit the BOCs, such as New England Telephone, to implement dramatic increases in their special-access rates? Why did the FCC settle for data and explanations that it almost certainly would find fatally deficient if proffered in support of similar increases for switched-access service (the service used to originate and terminate ordinary long-distance service)? There are no apparent satisfactory answers to these questions.

Informally, FCC staff members have suggested that because the BOCs are required to refund any excess earnings from special-access service, they should have substantial flexibility to increase special-access rates when the service seems to produce deficient earnings. The FCC, however, cannot know that special-access services are underearning because it has not required the BOCs to reduce their special-access revenue requirements to reflect lower demand for that service.

Is there another answer to the question of why the FCC has allowed the BOCs to raise their special-access rates so drastically? Some FCC staffers have stated See Con page 44

THE ISSUE:

# **Are BOC** requests for increases in special-access tariffs iustified?

ing revenue requirement shortfall created by tariffs made effective Oct. 1, 1985.

Thus, the only relevant data are from the actual seven months of operating experience, starting from the tariff effective date last vear until April 1986.

Additionally, some users argue that the company's alleged lack of supporting data for the increased rates places them at risk of being overcharged. This is not true.

Under the FCC's rate-of-return and enforcement procedures in Docket 84-800, the local exchange companies — not the end users are at risk if the filed tariffs do not produce the authorized rate of return.

Opponents of the new rates also contend that the special-access revenue shortfall has or will be shifted to other intrastate private or switched services. This is not true either.

New England Telephone properly applied the FCC's separations methodology in calculating the past period shortfall and projecting it to the future. Costs cannot be arbitrarily assigned to other

See Pro page 44

Telephone Co. has raised its rates by 20%; New England Telephone & Telegraph Co. has elevated its rates by 19%; BellSouth Corp.'s rates increased 9% in Georgia and 32% in Florida; and Mountain Bell's rates are up 29% in Arizona. 2% in Colorado, 70% in Idaho, 38% in Montana and 26% in Wyoming. And there may be more to come.

All of these increases were labeled "mid-course corrections." But as the increases themselves show, they are not mere corrections; they are major rate increases that the FCC's Common Carrier Bureau permitted to be filed on short notice and that became effective without adequate justification.

The BOCs contend that they have not been earning enough from the provision of interstate special-access service. If the underlying facts supported the BOCs' assertions, then legally there would be no basis for concluding that the BOCs have not

Blaszak, an attorney at McKenna, Wilkinson & Kittner, is counsel to the Ad-hoc Telecommunications Users' Committee.



# **Features**

September 22, 1986

Rolm's Dennis Paboojian As Rolm president, Paboojian is new to the public spotlight, but that doesn't stop him from being blunt and honest, even on the spot. In this exclusive Network World interview, Paboojian discusses topics ranging from the IBM/Rolm relationship to the switch maker's product plans.



The soft side of PBX management
Cutting over to a new PBX can give a
telecom manager hives. Without a
comprehensive management information
system program, the demands of users
can outstrip the communications
manager's ability to keep up with them.
And then, only the vendors will profit
from the situation.

Page One.

This page.



A policy gap widens

When it comes to setting national telecommunications policy, state and federal regulators seldom see eye to eye. State regulators see the FCC as moving into their regulatory turf and are put off by FCC Chairman Mark Fowler's attempt to consolidate policymaking in the FCC. In response, the states aren't just lobbying the feds for control; they're taking 'em to court.

Page 41.

No time for downtime

In today's multivendor environment, when your network's got a problem you can expect lots of

can expect lots of finger pointing and little action from vendors. With circuit quality declining and vendors becoming increasingly standoffish, inhouse network testing is becoming increasingly important.

Page 45.



► INTERVIEW

# Rolm's Dennis Paboojian

I object

to the word

takeover; I

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merger.

In contrast with its beautifully landscaped grounds replete with covered walkways, outdoor cafeterias, tennis courts and an employee fitness center, Rolm Corp.'s offices are surprisingly Spartan. Even the office of Dennis Paboojian, who succeeded Ken Oshman as Rolm's president in January, is far from opulent.

Paboojian previously headed up Rolm's now-divested Milspec Computer Division, a position that did not often place him in the public eye. As a result, he is not the completely self-assured public figure that his predecessor was. Unlike often interviewed executives. Pahoo-

ten interviewed executives, Paboojian hasn't yet developed the ability to summarize a complex issue in a single phrase.

But he more than makes up for that with an easygoing manner, a good sense of humor and a willingness to be bluntly honest in his answers.

Paboojian recently shared his views about Rolm with Ian Angus, president of Angus TeleManagement Group, Inc., a Toronto-based telecommunications consulting firm.

You've been president of Rolm since January. What changes have you made?

Ken Oshman told me once that general managers and presidents make one or two decisions a year. I'm still waiting for my one or two this year!

It's been an exciting eight months. Most of what I'm doing is

following through on the plans and strategies that we as a team had in place.

Of course, there have been many changes in our environment, so I've spent a lot of energy ensuring that people are comfortable, that we are still going where we thought we were going. But I wouldn't say that I've set out on a new course.

One big change at Rolm was the takeover by IBM two years ago. How has that affected you and Rolm?

First, I object to the word takeover; I call it a merger. Sometimes John Akers [IBM's chairman] says it was an "acquisition," but it really wasn't.

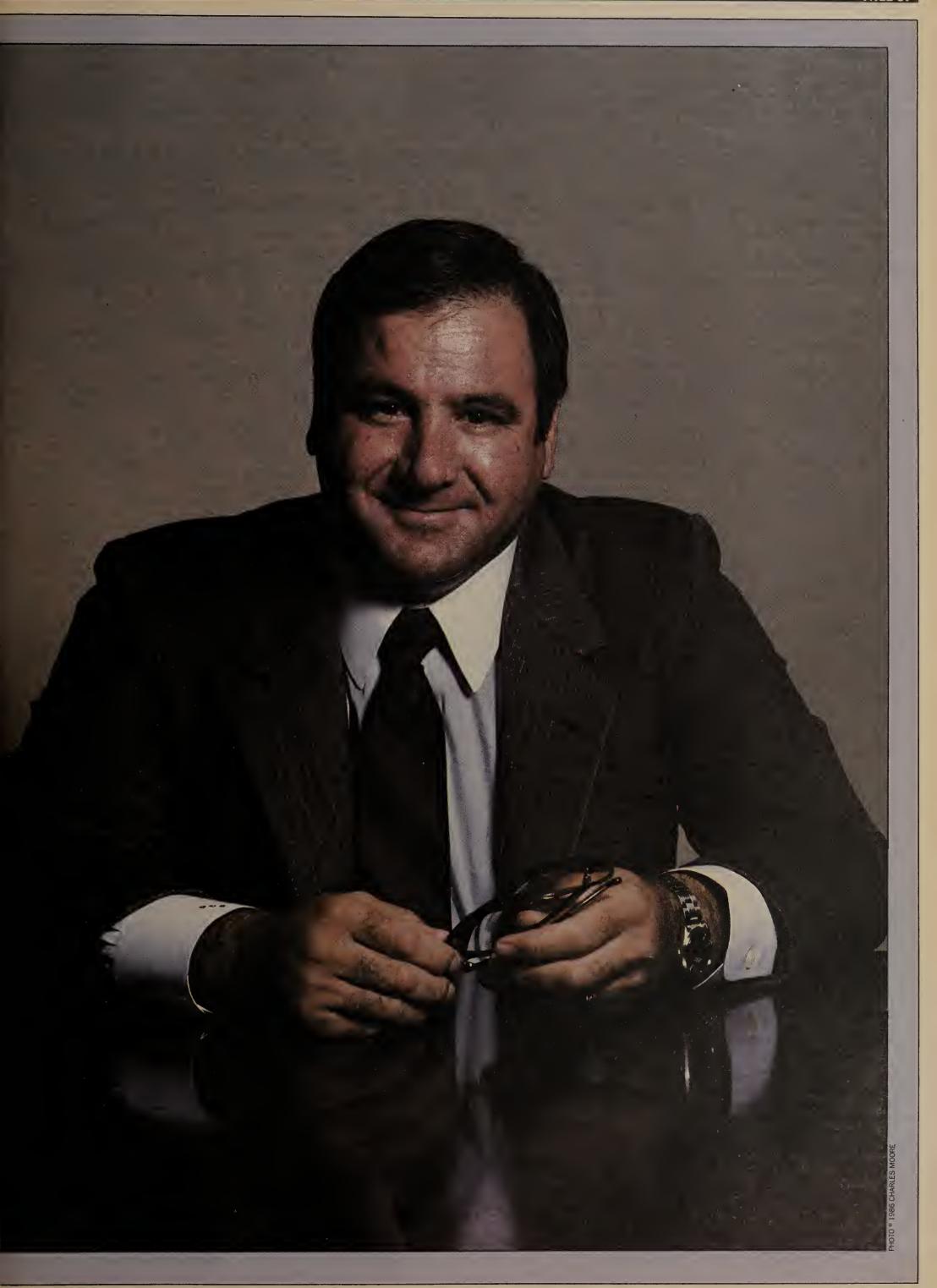
When I make presentations, I still use two slides we had made when we were first telling people about our relationship with IBM.

The first has our new logo that says, "Rolm — An IBM Company."
The second says, "IBM — A Parent of Rolm." I think the way to describe it is "IBM's involvement in Rolm." I'm enjoy-

Rolm." I'm enjoying it, although it's new and different.

IBM treats Rolm with a lot of respect. They recognize that Rolm has succeeded in a business where many other companies failed. In a sense, IBM feels that they failed to get into this business, so there's a great deal of respect in the relationship. They don't operate from the

Continued on page 38



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point of view that Rolm knows everything, but they respect the Rolm perspective on where telecommunications is going, and we have increasingly been a part of the forums where we can have influence in that area.

Of course, there's respect from Rolm too. I mean, who in the business doesn't respect IBM, one of the most significant success stories ever. We want to blend their views with ours because IBM has an awful lot to bring to the party as well.

One important development was

acquired Rolm,
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to work
together in the
market. ??

the appointment of Terry Lautenbach as president of IBM's Communications Products Division at the end of last year. He and I have developed a very close working relationship. We spend a lot of time together, and we have a lot of our people working on things together. There's a much greater sense of partnership now — a mutual partnership, not one in which IBM has taken over.

My relationship with Terry is not one in which I report to him or he dictates what I do or vice versa. We each have responsibilities. It's clear to both of us that we'll succeed to the extent that we leverage each other's strengths and minimize each other's weaknesses from an organizational point of view. That's how our relationship works—and that flows through the rest of the IBM-Rolm relationship.

Akers has said that IBM wouldn't know how to take over or run a company like Rolm, and they have no desire to do so. They want the Rolm talent that has gotten us to where we are today to continue to manage Rolm. They want us to tell them what we should be doing.

At the time of IBM's original investment in Rolm, many people expected a lot of joint IBM/Rolm activity in the market, but not much happened. Now there seems to be more — in particular, we're hearing about the Enterprise Marketing Program. How has that evolved?

When IBM originally made its minority investment in Rolm, both we and they were surprised to find that we couldn't then engage in joint marketing activities. We went into that initial relationship assuming that we could, but the lawyers

and others got involved and said we couldn't. So that delayed us for 15 months.

When IBM acquired Rolm, almost two years ago, we began planning in earnest how we could work together in the marketplace. The first thing was just introducing people to their counterparts in the other organization — who has which accounts and so on. Whether IBM and Rolm should jointly be marketing to a particular customer was left to individual initiative. That was good introductory activity.

The second thing we did was set up a compensation system that allowed the IBM people to be compensated for sales made by Rolm to IBM accounts. Clearly, IBM had coverage in many accounts that we didn't, and we wanted to create the right pull.

The Enterprise Marketing Program focuses on the largest accounts, primarily those in which IBM has maintained a continuing presence. It's a very broad program involving the creation of teams of Rolm and IBM people with mixed skills — sales as well as support skills.

Our objective is to create the same support structure for those large customers in telecommunications that IBM provides in data processing. And we've been successful thus far in doing it.

The single most recurrent rumor about RoIm is talk of a CBX-III—a private branch exchange that would use industry-standard pulse code modulation (PCM) techniques for digitizing voice. Before we discuss that, why did RoIm adopt a nonstandard digital PCM in the first place?

At the time we made that decision, there wasn't one standard. There were two, and it was an engineering judgment as to which would be the standard. It was also an engineering judgment as to which was better for what we were trying to do and what the economics were for each approach. We made a choice, and we're very happy with that choice. We didn't reject the standard — in 1973 to 1974, there wasn't one.

Today there is a standard for digital communications, and the CBX-II doesn't adhere to it. Does this create problems for your customers?

It only creates problems to the extent that people make a bigger deal out of it than is justified. What customers care about is functionality and the economics of functionality. So the real question is: "Does that decision impede our ability to provide functionality or to provide it economically?" If it did, we would figure out a way of changing it. But it doesn't. Today, we are able to provide more functionality than many other [PBX vendors]. For example, we provided digital phones before many companies did, and we certainly delivered them more pervasively than most did. Therefore, we've done it economically.

Some analysts have suggested that your nonstandard digital

technique will cause problems in the future, particularly when Integrated Services Digital Network arrives.

If you look at the digital technique that's used in Rolm phones, you will see that it is standard digital technology. We interfaced that with our existing technology and it works fine and economically. And we were one of the first companies to deliver an in-board T-1 interface — an interface to the standard for digital networking. So I'm very comfortable about our ability to continue to provide the functionality our customers are looking for and to do it economically.

I can't project the future, and I'm not here to announce our future product capabilities. Will we be able to do ISDN in the future? There is nothing about the current architecture that would prevent it from a functional or an economic point of view.

Nevertheless, there are rumors about a CBX with a new architecture. Some very explicit descriptions of the supposed new system have appeared in print. Does Rolm have another generation of PBXs under development now?

First, let me clarify something. Obviously, we have a large development organization, and there are many people here who are working on new products. We are continuing the path that we have been on, which is to help our customers evolve. We are continuing to improve the functionality of the CBX and to improve its economics.

able to do

ISDN in the

future?

Nothing about

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it. 99

Would you describe the sum of those efforts as a new PBX? Would you describe the CBX-II as a "new CBX" or an improved CBX-I? That's a judgment call. But is there a conscious "start-from-scratch" effort? Absolutely not.

Perhaps people fear that Rolm's relationship with IBM may push you into a computer industry mentality toward products, a mentality that makes the old box obsolete rather than evolving it. The telecommunications industry is seen as having avoided that sort of thing.

Actually, I think the telecommunications industry has had too much of "this box doesn't work with that box." In fact, I think Rolm distin-

guishes itself in an industry that has gone from analog to digital and left customers along the way. Rolm has distinguished itself by not doing that, creating upgrade paths for our customers as we and they have evolved.

[We did this] because we had a very solid architecture in the initial product. We evolved and extended that architecture, but it is still solid.

There will be changes. Some of them will be significant changes. The key is whether we will provide upgrade paths for our customers. Our objective is to protect those customers, to protect that investment and to evolve those customers.

The initial CBX and the CBX today are very different. They still have orange covers, but under the covers there's a whole lot of difference. One of the simplistic things that happens is that some people look at the outside of the box and say, "It's the same orange box; therefore, it's old technology."

Well, I'm happy for my competitors to view it that way, but I'm discouraged when customers believe it. What they ought to evaluate is: Are we providing the functionality, and are we providing it more economically than our competitors? They don't need to get involved in what the technology is—they only care about it because others are pointing at it.

The PBX market today is in something of a slump and in the future is ultimately limited. Oshman, your predecessor, once said that the worst thing about the PBX market is that everybody only needs one. If that is true, where do you see Rolm's growth occurring?

First, we haven't covered the whole marketplace, so there is plenty of opportunity to cover more of the market that we're in than we currently do. Redwood is an example of that. Taking the CBX-II 9000 up in size also allows us to cover more of the marketplace. We'll also cover the marketfrom a worldwide point of view more than we have in the past. There's substantial growth in doing all that, which people tend to underestimate.

Second, there are some important emerging areas that have to do with voice technology and its participation in the office. Voice messaging is an example. The opportunity is to integrate voice messaging [as] a normal part of the office environment [that is] integrated with text messaging and other information systems. That's a system problem, and it's one that we bring a lot to. There's potentially a lot of value added here [and] that's an exciting opportunity.

Northern Telecom, Inc. recently introduced the DV-1 and Wang Laboratories, Inc. has its new Wang Integrated Office Solution. These are products which are actually integrated PBX-computers. Do you see that kind of product emerging from the Rolm/IBM col-

Continued on page 39

# From page 38 laboration?

I don't. My personal view is that it doesn't make sense. The economics of large-volume computer manufacturing argue against hybrid configurations. Is there some economic benefit in linking voice switching and the computer processing in one piece of hardware? I don't think so. But it's an experiment: I think the jury's still out. I'm not overwhelmed by the economics I've seen so far. That architecture, while interesting functionally, has a set of economics that probably will inhibit its success.

You mentioned Redwood as a product that moves you into a new market. Redwood was under development for a long time. In fact, I think everybody in the industry knew for at least two years that you had a low-end product in the works. What took so long? Were there problems with it?

We always planned to announce that product when we were ready to ship it, not before. Redwood is the kind of product that you'd better be ready to ramp up very quickly. So the issue was: When will we be ready? We have very high standards of reliability and quality in our products; we announced and delivered Redwood when we felt we were ready, and we were not willing to do it sooner.

Would I like to have done it sooner? Absolutely. Were there delays? Not significantly. We are very pleased with what we did with Redwood. We would have loved to have it sooner, but I think the standards that we set for ourselves were the right standards, and not going before we were truly ready to support a high-volume, quality product was the right thing to do.

# Many people were surprised that Redwood doesn't support data switching.

You make marketing judgments along the way. If you're right, you win; and if you're wrong, you lose. I think we made the right one. It was argued that the need for data on the initial release at the low end was not as developed as it was at the high end.

In fact, in order to be cost-effective at the low end, we looked at nondigital technology, an approach other companies have followed. We concluded that would not be in our customers' interest or in our interest [and] that it was important to have an architecture that would support data in the future.

Our view was that there would be a very rapid ramp-up in that market — in that size system you're dealing with lots of volume — so having a system that was very reliable, that was easy to use, easy to learn and easy to configure was a more important objective than announcing the product with data [capability] on day one. That was a marketing judgment.

We never intended to have data on the first release; and in fact, it has not proven to be an issue with customers. It's more an analyst's or reporter's issue than a customer issue. Customers are interested in seeing what it does and what the economics are.

It's interesting to watch the press surmise that we had a grand plan with trading off VSCBX volumes for Redwood. I can't deal with the specific numbers, but I can tell you that VS volumes haven't changed as a function of Redwood being out there, and that was what we expected. They are two very different products, and they serve very different customer needs. The PBX version of Redwood is available now, but it will not impact VS sales because they're different products and different markets.

I've talked to consultants around the country, and there seems to be a perception that the quality of Rolm customer service has either declined in recent years or is not as high as its competitors. How valid are those criticisms?

I don't think they're valid. People often focus on one incident, and we all tend to generalize — if my foot hurts, everybody's foot hurts. I'm sure that there are particular situations, but overall, our level of customer satisfaction is excellent; our service is constantly improving.

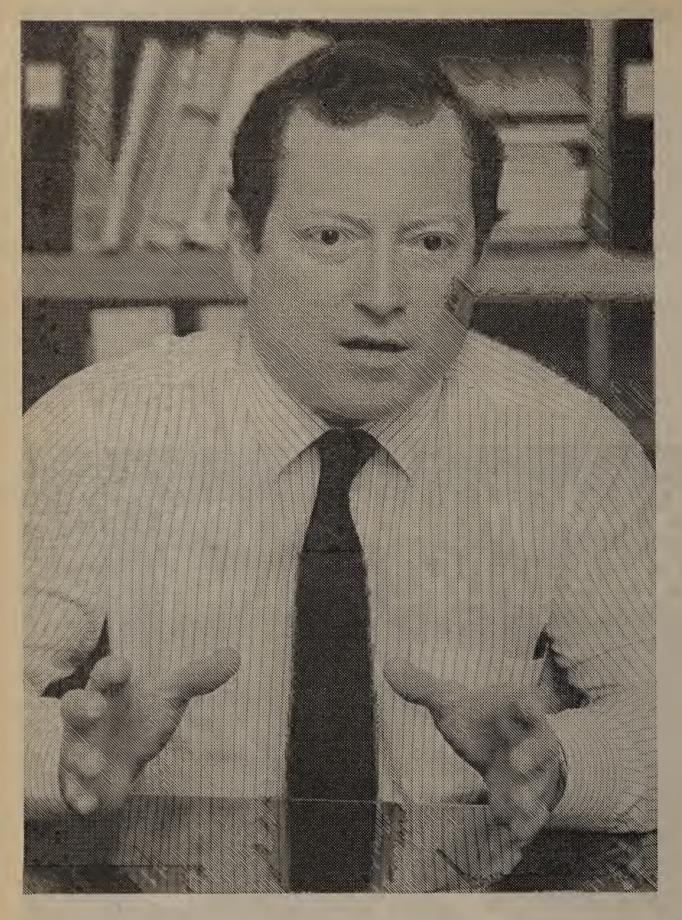
A few years ago, to get away from subjective self-evaluation, we began routinely polling our customers to get feedback about our service. We now have a history of these polls, and the data show that services sit at a very high level today, and it continues to improve. We poll a large number of custom-

ers, and these statistics come from that.

There is no question that the reorganization of the field organization that we went through in January was a difficult one for us. We asked our people to make extra efforts to ensure that our customers were not impacted, but I'm sure that there were some problems. But overall, despite the extensive reorganization that we went through, the statistics show that our customer performance continued to improve.

And, in fact, there are other, external people, who poll PBX users on their satisfaction, and their results tend to coincide with ours. So I'm confident that we're still on track.





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Prince I. Dyess President Tele-Communications Association

Prince I. Dyess is president of the Tele-Communications Association (TCA) and the Director of Telecommunications at the Scripps Clinic and Research Foundation in La Jolla, CA. TCA, based in West Covina, CA, is one of the largest regional user associations in the country. The 25-year-old association boasts more than 2,300 members and is growing at a rate of 15% per year. The organization has expanded its operation to include seven chapters located in five western states.





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REGULATORY ISSUES

# A policy gap widens

States are caught between irate small users and FCC policies tailored for large users.



BY GWEN MOORE Special to Network World

In the best traditions of federalism, telecommunications policy should be a partnership between the national government and the states. But in the last five years, a policy gap has developed between the Federal Communications Com-

Moore is chairwoman of the California State Assembly's Utilities and Commerce Committee. She is also chairwoman of the Transportation and Communications Committee for the National Conference of State Legislatures.

mission, which regulates interstate telecommunications, and the states, which regulate intrastate telecommunications.

In the face of stiff state resistance, the FCC has tried shifting the cost of telephone service — amounting to billons of dollars annually — from long-distance, which comprises mostly large corporate customers, to local, mostly residential and small-business customers.

The states have borne the brunt of public reaction, particularly in calls and letters from constituents who complain about the mysterious "access charges" on their phone bills, the confusion inherent in choosing a long-distance carrier and the generally disjointed telephone industry in America today.

# The Louisiana initiative

Fortunately, in Louisiana PSC vs. FCC, the U.S. Supreme Court reaffirmed the states' right to make policy for themselves. According to the court, the states have absolute authority within the intrastate sphere of telecommunications regulation. Intrastate telecommunications, the justices wisely note, interpenetrates, but is distinct from, the interstate sphere.

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The Louisiana decision did not come a moment too soon. Previously, in the absence of favorable lower court rulings, the states could only stand by as the FCC encroached upon their rights to ensure accessible, innovative and affordable telephone service for their telephone customers.

Without statutory authority, the FCC imposed on local customers an end-user access charge, which is a form of excise tax. Now the FCC is toying with the idea of doubling that tax.

It tossed out local zoning laws to facilitate satellite dish owners' in-

Then it tossed out the dish owners themselves by allowing scrambling of satellite programming.

Earlier this year, in a still-pending action, the FCC's Common Carrier Bureau pre-empted the Texas Public Utilities Commission by allowing an oil company to pick and choose among local telephone com-

panies, regardless of existing geographical franchises of long standing. If the FCC decision was upheld, it would have opposed 100 years of regulatory tradition.

Louisiana now blocks the way to this federal anarchy. But FCC

**66** In the absence of favorable lower

Chairman Mark Fowler is undaunted. Reappointed by the president in this election year to provide a semblance of national policy continuity, Fowler has big plans for the states.

In Fowler's little corner of utopia, the complete deregulation of local telephone service will bring about manifold benefits for states and their telephone users. Taking his cue from Back to the Future, a movie about adolescent relationships, Fowler calls for "a return to the future."

Precisely what that may be has yet to be spelled out, but Fowler continues to court state legislators and executives, whom he believes share his skepticism regarding public regulation.

He may even have found some allies among states where policies are still embryonic and, therefore, susceptible to the chairman's ideology and rhetoric.

#### The price of competition

Competition is no substitute for sound regulation. Public utilities are granted monopoly franchises because they supply vital public services, which society has determined must not be jeopardized by market fluctuations or the vagaries of corporate politics.

Regulation ensures that public

66 In Fowler's little corner of utopia, local telephonederegulation will bring about manifold benefits. ??

utilities remain publicly accountable. Few well-informed state policymakers would substitute unbricompetition for oversight and expect their constituents to benefit, especially with today's less-than-perfect markets and confused consumers. More than a century ago, Charles Francis Adams, the father of regulation, saw the folly of the type of "enforced competition" that Fowler holds as a panacea.

"The lack of an intelligent system and an ill-considered faith in manufactured competition has saddled [New England's] trade ... with a wholly unnecessary debt, which it cannot shake off," he said. "Under the system of competition, four [railroads], with all their costly machinery and corps of officials, must be sustained by Boston, while one each satisfies Baltimore and Philadelphia."

How familiar it sounds. Today, multiple telecommunications providers, encouraged by the FCC's socalled unregulation, compete for

court rulings, the states could only stand by as the FCC encroached upon their rights to ensure accessible and affordable telephone service. ??



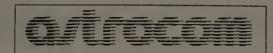
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120 W. Plato Blvd., St. Paul, MN 55107 (612) 227-8651, Telex: 297421 the right to serve large, high-volume corporate customers.

And they also compete for the right to go belly up. Many of these speculative ventures are folding, leaving behind infrastructures and employees for which there is no demand.

In addition, the local telephone companies, whipsawed by the threat of bypass, are trying to become more competitive by pushing for deregulation and selling unwary customers packages of luxury services with hard-sell, deceptive sales tactics.

#### New technologies

In some cases, as with Pacific Bell's Project Victoria, new technologies are being marketed to a high-tech, high-income audience without much regard for their broader applicability.

Because of state intervention, subsequent Project Victoria beta tests will be spread across a more heterogenous cross section of the population.

If the forces of technology are left in private hands, society may pay a dear price. According to communications economist Lewis Perl at National Economic Research Associates in White Plains, N.Y., competition has not lowered the price of telecommunications. Rather, it has shifted the burden of paying this price from the well-heeled to

Long-distance and toll prices are falling, while local rates are rising. Local ratepayers, comprising residents and small businesses, are being asked to pick up the tab for national corporations, which are the largest users of interstate and toll services.

California has created a temporary splint for the low-income household by levying a small tax on long-distance companies, which enjoy the benefits of reduced access charges.

This tax provides bare-bones lifeline telephone service for nearly one million low-income households.

But California, like other states, can do little to protect middle-income residential and small-business users, who are being asked to pay more and more for service that is not measurably better.

This is an unappetizing prospect for most state legislators and executives, who face re-election by their constituents.

State policymakers know that higher prices at the handset will reduce the average customer's incentive to make use of electronic mail, videotex and the other wonderful innovations competition is supposed to bring.

If we are serious about stimulating growth of an information-based economy, we must think carefully before burdening the majority of telephone customers with higher prices for the local service they find most useful.

On the other hand, in those states where policymakers and regulators have taken the greatest interest in telecommunications developments — New Jersey, Wisconsin, Illinois and California — the most exciting technological services are

being rolled out for public inspection and use.

Besides Pacific Bell's Project Victoria, Illinois Bell and Wisconsin Bell are testing Integrated Services Digital Networks.

et-switched services.

The FCC's activism has provoked state policymakers to take information and telecommunications policy seriously.

Several states have appointed New Jersey Bell is offering pack- special legislative committees to examine existing and proposed pol-

Last year, the National Conference of State Legislatures (NCSL) formally resolved to work more closely with the National Association of Regulatory Utility Commissioners in pursuit of their common

These organizations were cooperating by coordinating filing of amicus curiae, or friend of the court, informational briefs in the Louisiana case.

State legislators do not always agree with state regulators, just as Congress does not always agree with the FCC, but they are working together toward mutual goals. They also have a good relationship

Continued on page 44

**66** If we are serious about stimulating growth of an information-based economy, we must think carefully before burdening telephone customers with higher prices. ??

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From page 43

with the National Governors Association, which is now undertaking a survey of state telecommunications activities. Progress is being made.

In light of the states' growing policy sophistication, the NCSL adopted a policy statement in 1985 requesting Congress to "clarify the jurisdictional boundaries between the states and the Federal Communications Commission, so as to preserve the states' ability to make reasonable communications policy tailored to their respective needs and requirements, and to prevent and reverse erosion of their constitutional and statutory policy authority."

The definitive quality of the Louisiana decision answered this need, even though Congress allowed the Communications Act to remain ambiguous.

But even as the justices were handing down their decision, Senate Republicans were hatching plans to introduce legislation that would usurp state regulatory authority once and for all.

The Dole bill would transfer control over AT&T and the baby Bells from the courts and state regulatory commissions to the FCC.

This bill would put an abrupt end to the states' importance as social laboratories, a function that U.S. Supreme Court Justice Felix Frankfurter believed is one of the best features of our system of government.

The Dole bill would not only homogenize regulation of U.S. telecommunications policy, it would do so under an agency whose handling of complex regulatory issues has been of mixed quality. Furthermore, at the time of this writing, not a single state representative has been invited to participate in the Dole bill hearings.

The states agree with Congress and Fowler that it's time to re-examine U.S. telecommunications pol-

But as the NCSL declared in a recent resolution, this investigation should be public and broadly participatory, rather than conducted

throughout the truncated proceedings of the FCC or in a last-minute legislative rush. This country can do better.

In California this year, a legislative task force on telecommunications will be convened as the first step in reworking the state's existing codes. After regulatory experts help define the issues, legislative hearings and other public devices will incite a thorough social commentary on the future of telecommunications policy in California. Other states may do the same.

In the field of telecommunications policy, the states are taking the lead. Congress should not pass legislation that impedes the states' progress.

Instead, it might develop a more viable national policy by revisiting next year the various proposals that have been made this year and inviting the states as full-fledged participants in the policy debate.

The states can hold their own in the old federal/state telecommunications partnership, which the Supreme Court has reaffirmed.

**Transmission** from **page 34** side on an optical disk.

These compressed documents will be shipped via dedicated high-speed (56K bit/sec) phone lines from a San Jose outpost to the main campus in San Jose and then via AT&T 56K bit/sec dial-up lines to Charlotte, N.C. From Charlotte to Wilmington the data will move a bit slower, as AT&T has not yet installed 56K bit/sec lines on that route. At GE's Wilmington plant, the data will be stored on optical disks for decompression and retrieval by computer terminals.

"Eventually each drawing will be able to be sent in less than a minute," says Frank McCarthy, Program Manager for Automation at the GE Nuclear site. "At first, though, with the slower AT&T lines at the end of the trip, it will take about three minutes. If we can get this technique to work well, it will save us a lot of time in sending good quality pictures from one place to another. It broadens and makes our communications possibilities far more efficient."

The GE application is a creative attempt to move the technology to a higher plane, but it is not yet an approach for the faint of heart. The effort has taken well over a year to implement, costs well into six figures and is still considered somewhat dicey. Technological pitfalls aplenty are expected to befall this project before it is considered sound.

Until communications technology and optical scanning and retrieval equipment learn to relate on a day-to-day level, image processing will remain mostly an in-house, perhaps local-area network-based, application, but one worth investigating carefully. For instance, in certain situations, image processing is an excellent alternative to storing documents with micrographics. Analyze the record retention system and needs that exist at your company. Are most of your documents kept for a long period of time and accessed infrequently? Are they mostly held on to for financial auditing and legal needs? If so, micrographics are a cost-effective method for such storage because they are a low-cost technique to store a high volume of documents.

However, if the records are fairly active, then image processing equipment is a better alternative. Mortgage documents, for example, remain on file for an average of only five years, with at least some annual activity involving them. An image processing system could retrieve these documents in a matter of seconds, deliver them to a terminal where they can be adjusted and worked on and then store them again in another few seconds. The time saved compared with using micrographics in these cases and the ability to put these documents on a computer for manipulation make it a far better choice.

The various forms of image processing should not be judged by today's achievements. It's a young technology that will eventually be an essential corporate communications asset — but odds are not before at least the mid-1990s. 2

#### Con from page 35

that private-line service has been underpriced for years (of course, past earning deficiencies are irrelevant to the current situation) and seem to believe that it would be more efficient if there were more usage of switched access service and less reliance on dedicated carrier-provided private-line networks. If this is indeed the thinking at the FCC's Common Carrier Bureau, it could explain at least some recent rate changes.

While we cannot know with certainty why the FCC has shown such extraordinary tolerance for massive special-access increases, we do know that the BOCs have traditionally disfavored privateline loops and have attempted to migrate private-line customers to

switched services. This migration strategy seems to have picked up substantial momentum. Special-access rates, and thus the cost of private networks, keep climbing, while switched-access rates and the cost of toll and Wats lines have dropped.

If this migration strategy succeeds, users will be more dependent on switched services and will have fewer competitive alternatives. It could significantly limit competition in enhanced services as the BOCs force customers to utilize their natural monopoly network switching facilities.

In short, the BOCs will gain even greater control over the telecommunications market, carrier-provided private-line networks will be in jeopardy (in some instances, they already are) and there could be even less predictability in the long run for telecommunications

Too m

Too much is at stake for companies that rely on carrier-provided private-line networks to concede the success of the BOCs' migration strategy.

The FCC must understand that private-line networks have and will continue to produce significant technological and economic benefits. Companies that have built and rely on carrier-provided private-line networks have a right to regulatory protection from the BOCs' migration strategy.

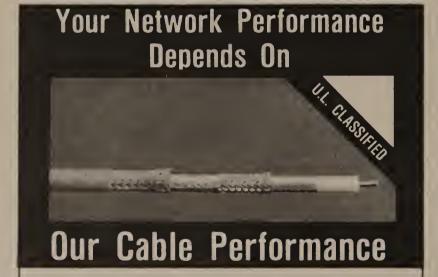
# Pro from page 35

services. Regarding arguments that the mid-course correction is an attempt at strategic pricing, New England Telephone maintains that the rate revisions will establish rates targeted to earn the authorized 12.75% return, thereby eliminating the uneconomic incentive for customers to seek special access that is caused by current rates being below costs.

As part of the FCC's ongoing investigation of special-access rates and rate relationships, the commission is investigating the allocations of costs to individual special-access categories.

During this investigation, New England Telephone is required to keep detailed accounts of specialaccess billings to enable recalculation of rates and refunds based on the overall level of rates or the revisions of specific rate elements.

Neither New England Telephone nor New York Telephone has proposed increasing its earnings above the authorized 12.75% for the remainder of the rate period to recapture revenue shortfalls previously experienced during the rate period. The new rates were requested to correct future special-access revenue shortfalls until the tariff expires on Dec. 31.  $\square$ 



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# Proper testing can prevent user problems.

BY EDWARD HORRELL

Special to Network World

Under Murphy's law, if something can go wrong, it will. Under the laws of network testing, if something can go wrong, it already has. The problem for the network manager is that he doesn't know it yet.

Network testing, a function of network control, is the process of determining the state of individual circuits and related hardware. If testing reveals degraded service, fault isolation procedures must be used to identify faulty components.

Traditionally, network managers have taken a reactive approach

Horrell is president of Mitchell & Horrell, Inc. in Memphis, Tenn.

to network problems, relying exclusively on fault isolation. Network testing lets telecommunications managers take a proactive approach by identifying potential problems before they affect users. Although it's impossible to test every circuit, testing critical circuits can prevent major headaches.

Changing times

Four current conditions have contributed to the increased importance of network testing since the advent of deregulation. First, voice circuit quality has declined since deregulation. Few communications managers can say that they now enjoy better quality voice circuits. Changes in Bell operating company and common carrier testing procedures, combined with staff cut-

backs and turnover and a hands-off attitude toward multivendor environments, have contributed to the generally low quality of service.

Second, end-to-end testing of the public switched network has become impossible for the BOCs. Circuits that connect with the numerous switch facilities, private branch exchanges, automatic call distributors, Centrexes and so on virtually prohibit end-to-end testing of all network parts. The effectiveness of local testing by the BOCs has also declined because of increasingly diverse multivendor environments. Only the user, through a series of tests, can approach end-to-end testing.

Third, communications managers and senior management now re-

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ICH JENNANT

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alize that voice and data networks are of equal importance.

The critical role of a reliable voice network to the success of a business has become agonizingly clear as a result of the drastic effects of deregulation on voice communications.

Finally, in today's environment of multivendor networks, vendor support for network testing is pathetic at best. Finger pointing is at an all-time high among vendors that are increasingly concerned with their own performance within the user's network and are showing little concern for end-to-end uptime. Anyone who questions the validity of this statement should try relocating a complex voice network

Understanding the state of network testing in today's environment does nothing to reduce the chance of circuit failures.

The effects of these failures, however, can be mitigated through preparedness and by understanding how problems can be isolated and corrected.

#### Testing alternatives

In the past, users were content to rely on telephone companies or equipment vendors to aid in the correction of network and circuit problems. As a result, there has been, until recently, little impetus outside the telephone companies to

When critical role of a reliable voice
network to the success of a business
has become agonizingly clear as a
result of the drastic effects of
deregulation on voice
communications. 29

develop or market diagnostic systems. With the exception of a few very large companies, most users were comfortable in this environment.

In the current environment, managers are challenged with replacing in-house testing procedures and functions formerly carried out by the telephone companies. Managers have three options for network testing: Rely on the vendors, use a specialty firm or handle the job in-house.

In the first option, the selection of the vendors is based on their ability to diagnose and correct the user's network problems. Ideally, these vendors operate as the user's agent and handle service restoration for a fee.

Although such arrangements look good on paper, they have a few drawbacks. First, fewer and

fewer vendors want to do this. Also, it precludes future network flexibility because users are locked into using specific vendors for network services. This option is on the decline, despite vendors' sales pitches.

The second option — using a specialty firm — is the equivalent of contracting labor from a third party that provides expertise to diagnose and correct problems and occasionally provide routine maintenance. Although this can reduce staff, it often is not a cost-effective solution.

Finally, the in-house management approach allows for greater flexibility in design and operation and enables the communications manager to better understand user difficulties. It also requires greater resource commitments on the part of the communications department. This option is becoming increasingly predominant among large users, and telecommunications managers are showing much interest in both equipment and procedures for network testing.

# Testing prerequisites

Before beginning the testing, the telecommunications manager should have a good overall knowledge of the network. He also must determine the best access to the circuit to be tested; he should have the appropriate testing equipment; and he must determine standards for network uptime and communicate those standards to vendors.

In any network, there are many ways to access the circuitry. They range from a simple dial access, in which a circuit group is accessed via the PBX system, to more complex switched access test systems that are directed by a computer. Unless testing is completely automated, the communications manager should require specific procedural documentation to determine what access methods the circumstances dictate.

The capabilities of test devices have undergone radical changes in recent years. The accuracy, functionality, size and flexibility of network testing equipment is constantly improving. A plethora of devices perform testing in such areas as transmission, direct current loop and signaling. Additionally, devices such as automatic circuit testing equipment and switched access maintenance systems add more automatic control to the network.

The use of automatic testing systems is the leading cause of change in the network testing arena. Com-

panies such as Network Control Corp. of Danbury, Conn., offer processor-based automatic testing devices, which test trunk lines, Wats, foreign exchange and off-premise extension circuits as well as T-1 lines, microwave and satellite

Systems of this type are usable for one or more locations and provide real-time information about the status of all circuits.

But whether testing is manual or automatic, the most important area of management is the ability to understand what is acceptable performance and to communicate those standards to vendors. In this regard, many users discover that vendors perceive network testing as an aid, not a hindrance, to their performance.

Harold Johnson, senior vicepresident of Telecommunications and Office Automation for First Tennessee Banks, is responsible for voice and data communications for a six-billion dollar holding company. He describes the network control center as "the heartbeat of it all." Johnson concurs that voice communications has taken its rightful place alongside, if not ahead of, data communications. His daily routine of testing each line provides information to vendors before they would normally be aware of trouble.

First Tennessee's vendors say that their job is now easier. Each month, Johnson and his staff meet separately with the BOCs and AT&T to report on their performance within First Tennessee's network. The joint meetings of the BOCs that service the bank's many locations have led to friendly competition in the area of uptime. Johnson says that this competitive nature has resulted in significant increases in network performance.

# Up and coming events

As for the future, current trends will lead to a number of new developments. First, network testing will become standard operating procedure for all large users. Vendors will virtually abandon responsibility for network and circuit uptime, and users will be responsible for crossing multivendor boundaries and seeing that their networks operate smoothly as a whole.

Second, the use of automatic testing equipment for voice networks will take its rightful place alongside the popular testing equipment for data communications circuits. In addition, PBX manufacturers and distributors will begin to provide this equipment as part of their systems package.

Finally, there will be a major network failure within the next 12 months that will cause communications managers across the country to reassess their testing procedures

When this takes place — and it will — a new area of interest will emerge to stimulate great interest in the telecommunications industry. That area, which has been largely ignored, is disaster recovery planning. \(\mathbb{Z}\)

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# The soft side of PBX management

Software is the key to managing a new system.

# **Continued from page 1**

support private communications systems that are increasingly seen as corporate revenue-producing tools. But there is a caveat: The maximum benefit from a PBX will only be realized when the communications manager can accurately track system costs and reconfigure the system quickly in response to changing circumstances.

The key is creating a computerized, software-based telecommunications management information system. First, all new system information must be collected and placed into three data bases: PBX parameters, internal plant records and administrative information. Once these three data bases are constructed (see story on page 48), they must be integrated to form the core of system information that will be accessed by the management system.

The management system software consists of several separate programs that share a common, integrated data base. For smaller PBX systems, all staff members can share an IBM Personal Computer AT workstation to access and update the data base.

For larger systems, it may be necessary to distribute copies of the data base to multiple, networked personal computers on a read-only basis. The manager can then regularly distribute updated copies of the master data base to users over the network.

There are five basic elements to

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the management system software, including a system parameters program, an order generator, a financial management module, a rate comparison program and a conversion program.

# The system parameters program

The system parameters program provides the communications manager with an overall profile of the system, including an inventory of equipment and its location as well as a detailed profile of each user. The information used by the parameters program comes from PBX records assembled by the vendor, such as station line appearances, station features, routing tables and trunk groups; from plant records that describe the wiring path from switch ports to station sets and provide a directory of all intermediate distribution frames (IDF); and from administrative records that identify each station user, his department and the station's budget or cost center.

The system parameter records can also be used to create an on-line directory that can aid system attendants in avoiding problems such as misdirected calls and slow answers — sources of user irritation.

If your PBX vendor can't supply this program, set your programming department on it, but be aware that developing this directory program will eat up large chunks of their time.

# The work order generator

Ideally, the work order generator should be in place early, so that it can be used during the PBX installation and cutover as well as

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during later normal operation. It should provide information about work on order, work in progress and work completed.

Making an effective order generator means sitting down with vendors and developing a system through which management-system-generated work orders can be downloaded in the proper format to the vendors' operations departments for implementation.

This also enables the vendor, after the work is done, to provide information directly to the system, so that the completed orders can be logged for billing to the proper budget and cost centers.

The key to controlling PBX service and maintenance costs is properly managing the vendor, and a work order generator is invaluable in doing so.

When a line is moved, added or changed, for example, the telecom-

munications manager can save money by managing the vendor and deciding for himself which pairs to use to create the new run, including any spares that should be put to use and the number and location of IDFs.

With this information on the work ticket, one technician can handle the wiring.

Yet another advantage of a work order generator is that it makes it easier for the communications manager to detect discrepancies on bills, or multiple billings for the same operation.

#### The financial management module

The financial management module can be used to develop and justify a budget for the communications manager's department.

It saves staff time and money for the manager by generating financial reports that include informa-

# PBX DATA BASES

# Garbage in, garbage out

No matter how carefully it is manufactured and installed or how sophisticated its management system software is, a private branch exchange with a sloppily collected management system data base will give its users nothing but headaches.

The three principal types of information included in a PBX management system data base are the PBX parameters, the internal plant (wiring and cabling) records and the user administrative information.

#### **PBX** parameters

Once a user selects a PBX and signs a contract, the vendor's customer service representatives analyze the user's needs and set up the PBX.

Unfortunately, most vendors' customer service departments have insufficient budgets and are chronically understaffed and overworked

Consequently, their analysis often means breezing through the customer company, counting station sets, estimating the number of call pickup groups and call forwards, scanning the intracompany directory to find the direct inward dialing stations, asking secretaries whose phones they answer and assigning everybody a class of service.

They then take an obligatory peek into the switch room to see what trunks appear at the carrier-user demarcation point before entering the information into a system generator for processing.

PBX parameters collected in this cavalier manner are likely to

be shot through with errors. The result is that the communications manager suffers through week after week of software reconfigurations, hoping that the vendor will get it right before the cutover is completed.

Ideally, users should define their own systems long before signing the contract. They should find out what lines appear on what sets, figure out who gets direct inward dialing numbers, find a set of floor plans, mark the location of each station and so on.

Most importantly, communications managers should ask line management in sales, production and other departments not only what they need, but what they want

Then communications managers can lead vendor representatives from station to station and sit them down with each user and line manager enabling everybody to understand what is expected.

Vendor customer service departments normally supply forms for defining the software controlling each station. Before initialing and dating the forms, the telecommunications manager should have each station user inspect them to make sure they are accurate.

The users should also initial the forms so that they can't tell the manager on cutover day that they asked for a different arrangement.

The same should be done with other forms on which the class of service definitions, trunk tables and least-cost routing parameters are specified. Before the customer service representatives leave, all forms and worksheets should be copied and put under lock and key. They make up the telecommunications manager's system bible.

This approach to the system definition process will take more time than vendors like to spend on it, so expect them to squeal like stuck pigs.

The internal plant comprises all system wiring. A 1,000-station PBX will need an internal plant of at least 3,000 pairs or more, and the telecommunications manager has to keep track of it all. The best way to do so is to supervise the vendor technicians closely, perhaps by assigning staff members to monitor their work and ensure that they keep good records.

Cable records from most vendors consist of a few smudged and scribbled sheets of paper stuffed into a pouch inside the switch cabinet. Because they are seldom updated, they quickly become obsolete.

When no accurate records are available for reference and a cabling change is needed, two \$40-an-hour vendor technicians — one on each end — are needed to sort through all the wires.

Accurate, up-to-the-minute internal plant records are a good way to eliminate excessive labor costs, not to mention minimizing the aggravation of having technicians slogging through the wire closets and overhead cable trays.

# Administrative arrangements

Besides tracking PBX parame-

ters and internal plant records, telecommunications managers should maintain a data base of internal company information that does not involve the vendor.

Among that information should be:

- An internal telephone directory organized by person, department, job description and station number.
- A list of budget and cost centers, especially in a shared tenant services application. Assign a cost to every kind of station set, plant facility and switch port. These figures should be loaded with a prorated cost for the switch room square footage, administrative overhead and the like.

This information is needed to bill each operational entity in the firm or each tenant on your system. A station message detail recorder is a must.

A list of rate bases for all interlocal access and transport area carriers. With the welter of carriers available these days and with rates in a constant state of flux, telecommunications managers need to keep this information current almost on a day-to-day basis.

True, these recommended data base collection procedures will be time-consuming, but they pay off after the cutover because the amount of time users will have to spend on maintaining the MIS system will be minimal.

Better yet, your efforts will be appreciated by everyone in the company — including upper management.

— Thomas LaBelle

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tion on both fixed and variable assets.

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Variable expenses include the bills for message units and toll charges the set runs up each month, such as calls received over 800-service lines.

Other costs include outlays for service and maintenance.

Providing such detailed budgetary information may be gilding the lily for smaller companies, but it can score points for the communications manager at a large company — particularly when upper management is picky about the quarterly bottom line.

The company's comptroller should help design the management system's financial program so that its structure parallels that of the corporate accounting system.

#### The rate comparison program

The rate comparator is a tool used to determine optimum carrier rates that the user can then program into the PBX's least-cost routing system.

The comparator can also compare carriers' newly announced discount rates with other carriers' existing rates or analyze what-if scenarios that take into account times, area codes, call volumes and other parameters and determine the cheapest carriers, services or lines to use for specific applications.

The core of the rate comparator is a data base that contains the rates of all carriers to which the user has access.

If a carrier calls up and announces a discount, you can plug in those new rates and quickly compare them to those of other carriers.

There are a number of rate comparison programs on the market, but beware of those that only cover Wats lines. If AT&T and the Federal Communications Commission have their way, Wats will go the way of the dodo bird in the next 12 to 18 months. As a minimum, a comparison program should cover direct distance dialing and MCI Communications Corp. services, as well as Wats.

Also, if the program's pricing is based on the vertical and horizontal coordinate system (V&H) tables that calculate the airline mileage between two points on the vendor's network, the user must subscribe to the vendor's V&H/local exchange prefix update service.

Not only must the user pay to get a list of any new local exchanges that are put into service, but updates only come out periodically.

As a result, a lag will occur between the time the calls can be made to the new local exchange prefix and when their prices can be determined using the call accounting system. A comprehensive rate comparison program is difficult to write, and only a large user is likely to profit by developing one inhouse.

Lastly, conversion programs read the data files from disparate devices such as the PBX's parameter block and station message detail recording (SMDR) devices. These programs convert all data into the uniform format and language used by the rest of the management system software routines.

Though they don't produce information that the communications manager can use directly, conversion programs perform the background tasks that make the management system work as a whole.

# **Basic requirements**

Minimum requirements for running management system software (for systems up to about 5,000 lines) include a PC AT with 512K

bytes of random-access memory, a 40M-byte hard disk and a tape cassette for archiving. The computer also needs enough I/O ports to support all user needs.

Users may need to gather data from the PBX's System Administration as well as from its SMDR or the SMDR processing devices to get an accurate picture of port requirements.

Ports may be needed to connect modems for downloading work orders to the vendor and contacting other data bases such as a V&H service.

In addition, the system will require a port for at least one printer, and the telecommunications manager may want a dedicated dial-up port to allow remote access by tech-

nicians. Finally, whether a management system program is bought from a consultant or a vendor or written from scratch by the user's staff, it should be easily convertible to run on a minicomputer or a mainframe.

Therefore, it should be written in one of the ubiquitous business languages such as Compile Basic, Cobol or C.

Unless a comprehensive management system program is in place by the time a new PBX system is cut over, the demands of users may well outstrip the communications manager's ability to keep up with them.

And then only the vendors will be in a position to profit from the situation.

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# TARIFF REVIEW

# **Users blast FCC conduct**

BY MICHAEL FAHEY Staff Writer

WASHINGTON, D.C. — Groups representing some of the largest user companies in the nation have charged that the Federal Communications Commission's Common Carrier Bureau violated federal law by meeting with representatives of the local exchange carriers — but not users — to discuss upcoming tariff filings.

The Ad Hoc Telecommunications Users Committee, the International Communications Association and seven other organizations recently filed a complaint with the FCC alleging that meetings between bureau personnel and members of an industry task force violated the Federal Advisory Committee Act. The statute was enacted in 1972 to regulate advisory committees made up of governmental and nongovernmental employees.

According to Ad Hoc Committee Attorney James Blaszak, on Aug. 15, the Common Carrier Bureau released an order specifying the cost support material that local exchange carriers must provide with their Oct. 3 filings for 1987 privateline special-access tariffs.

The order, Blaszak said, referred to meetings between FCC and industry representatives. According to Blaszak, the order notes the FCC's view that the meetings helped formulate a tariff review plan that can be implemented "without burden" to local exchange carriers. Blaszak said the FCC refused to say when the meetings with the carriers were held.

The groups filed an emergency application for review with the FCC, requesting that the Common Carrier Bureau vacate its Aug. 15 order and open the tariff review plans for public comment.

"The issue strikes me as a very fundamental procedural question," Blaszak said. "Why is the agency developing tariff review plans with the carriers but not including the carrier's customers in the process?"

Blaszak said that if the application for review is rejected, the group may resort to legal action.

John Cimko, chief of the FCC tariff division, said his agency is considering the application for review, and no date has been set for a ruling on the matter.

Cimko defended the meetings between FCC and industry representatives, saying they would speed up the formulation of private-line special-access tariffs for 1987.

"We decided that, in order to facilitate our review of the access tariffs and the review of those tariffs by interested parties, it would be useful to give a further definition of what we wanted [from the carriers] in the way of cost support," Cimko said. "In order to achieve uniformity, we decided to hold meetings with local carriers to advise them of the kind of information we wanted from them."

Cimko said his agency was attempting to devise a tariff review process that would not place "undue burden" on the carriers. He also said that if the FCC had not issued its Aug. 15 order setting out the cost support material, the carriers "would have unilaterally defined the kind of cost support they wanted to submit to us."

Cimko added that interested parties would have the opportunity to comment on the local exchange carrier local-access tariffs after the Oct. 3 filing date.

# Intecom from page 2

In addition to equipment failings, including misrouting of calls and line problems, Intecom did not supply software for the switches that it had agreed to deliver, the official said. RTS claims it had asked to be allowed to participate in American Network's suit against Intecom, but its motion was denied.

Intecom last week acknowledged the RTS suit and said it has retained counsel. The company reportedly manufactured fewer than 20 of the TSX switches. The company developed the switch about five years ago for tandem switching but later decided not to pursue that market.

In addition to the RTS Teleleasing suit, Intecom is facing binding arbitration with the University of Denver because of problems related to Intecom IBX equipment installed in 1984 at the university at a cost of \$3.5 million.

The contract between the university and Intecom reportedly calls for such arbitration to resolve contractual differences. Hearings in the arbitration process are scheduled to begin Oct. 14.

Attorneys for the university were unavailable for comment. Intecom described the situation as "private arbitration between the two companies to resolve contractual differences of opinion over what's working and what's not."

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Sept. 22-23, Boston — Understanding Data Communications. Also, Sept. 25-26, St. Louis, Mo.; Sept. 29-30, San Jose, Calif. Contact: Data-Tech Institute, Lakeview Plaza, Clifton, N.J. 07015.

Sept. 22-23, New York — The Information Center and Fourth Generation Languages/Systems (4th GLS). Contact: New York University School of Continuing Education, Seminar Center, 575 Madison Ave., New York, N.Y. 10022.

Sept. 22-24, Washington, D.C. — Principles of Traffic and Network Design. Contact: abcTeletraining, Inc., Training Manuals/ Workshops, P.O. Box 537, Geneva, Ill. 60134.

Sept. 23-24, Washington, D.C. - The Future of Centrex: Centrex in the New Computer III Environment. Contact: Rose Hill, Conference Registrar, Phillips Publishing, Inc., 7811 Montrose Road, Potomac, Md. 20854.

Sept. 23-24, Dallas — Nepcon Southwest. Contact: Infomart. Suite 6038, 1950 Stemmons Freeway, Dallas, Texas. 75207.

Sept. 23-24, Washington, D.C. - Hands-On PC Networks. Also, Oct. 21-22, Boston; Nov. 4-5, Palo Alto, Calif.; Nov. 18-19, Washington, D.C.; Dec. 9-10, Los Angeles. Contact: Integrated Computer Systems, 5800 Hannum Ave., P.O. Box 3614, Culver City, Calif. 90231.

Sept. 23-26, Washington, D.C. Computer Network Design and Protocols. Also, Sept. 30-Oct.1, San Diego; Nov. 4-7, Los Angeles; Nov. 18-21, Boston; Dec. 2-5, Washington, D.C.; Contact: Yolande Amundson, Integrated Computer Systems, 5800 Hannum Ave., Culver City, Calif. 90231.

Sept. 24-25, Chicago — Introduction to Fiber-optic Communications Systems. Also, Oct. 8-9, New Orleans. Contact: Hinckley Communications, Inc., 14 Parker Road, Osterville, Mass. 02655.

Sept. 24-25, Denver — Micro-Mainframe Links. Contact: Digital Consulting Associates, Inc., 6 Windsor St., Andover, Mass. 01810.

Sept. 25-26, La Jolla, Calif. — Third Annual Intelligent Buildings Conference. Contact: Cross

Information Co., Canyon Center, Suite 311, 1881 9th St., Boulder, Colo. 80302-5151.

Sept. 25-26, St. Louis, Mo. — Tutorials in Computing. Contact: Center for the Study of Data Processing, Washington University, Campus Box 1141, St. Louis, Mo.

Sept. 25-27, San Francisco — Fourth Annual Personal Computer Faire. Contact: The Interface Group, Registration Dept., 300 First Ave., Needham, Mass. 02194.

Sept. 26, Newton, Mass. — Macros on Lotus 1-2-3: For Power Users. Contact: Joan Merrick, Boston University Metropolitan College, Seminar Coordination Office, Suite 415, 850 Boylston St., Chestnut Hill, Mass. 02167.

Sept. 28-Oct. 2, Dallas — Society for Information Management's Annual Conference. Contact: Society for Information Management, Suite 600, 111 E. Wacker Dr., Chicago, Ill. 60601.

Sept. 29-30, San Francisco -Satellite Technology for the Nontechnical Manager. Also, Nov. 13-14, Washington, D.C. Contact: Phillips Publishing, Inc., 7811 Montrose Road, Potomac, Md. 20854.

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Oct. 1, Hartford, Conn. — Dealing with Vendors and Suppliers. Also, Oct. 7, Boston. Contact: Performance Seminar Group, 11 Commerce St., Norwalk, Conn. 06850.

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#### MAP from page 8

nications, Inc. debuted a single-card MAP net interface and an external modem that allow users to hook IBM Personal Computers and Industrial Computers to 10M bit/sec broadband MAP local-area networks.

The product introduction came on the heels of an announcement from IBM and joint product development partner Industrial Networking, Inc. (INI) of a two-board interface set designed to accomplish the same task.

Concord Communications said it will provide broadband communications networking gear to both Sytek, Inc. and Motorola, Inc. Under the terms of their multiyear agreement, Concord Communications will supply Sytek with its 10M bit/sec head end remodulators and broadband modems.

The Concord Communications products will be incorporated into Sytek's Localnet broadband network offering. Concord Communications also inked a multiyear pact to supply Motorola with its head end remodulators.

Codenoll Technology Corp. and Computrol, a division of Kidde Automated Systems, announced 10M bit/sec fiber-optic modems and media systems reportedly designed to work with MAP. The two companies inked a joint product development agreement earlier this year.

Codenoll's Codenet 3410 and the Computrol M-10F modems are designed to operate with token-bus controllers from Motorola, Intel Corp. and INI that use the VME or Multibus system buses. Codenoll also debuted Codestar, a fiber-optic cable star coupler to which lightwave modems can be linked using fiber-optic cables up to two kilometers in length.

INI and Simpact Associates, Inc. joined forces to market an interface that reportedly links Digital Equipment Corp. Unibus-based VAX and PDP minicomputers to INI's MAP/One factory floor network.

Under the agreement, Simpact will resell INI's family of MAP-compatible products. Simpact will provide the serial interface boards and software drivers, operating under DEC's VMS or RSX operating systems, necessary to connect the pro-

cessors to INI MAP components.

Simpact also announced three board products capable of establishing serial links between Q-bus, Unibus and VAXbi-based DEC computers and MAP 2.1 factory nets equipped with any interim network interface unit that conforms to the High-level Data Link Control line access procedure, balanced portion of the MAP 2.1 specification. The interface unit must also provide an upper layer interface such as Session 5 or Common Application Service Element, which is part of the seventh layer of the MAP specification. 🔼

#### AT&T from page 7

optic proposals that may be incorporated into the MAP and TOP specifications at a later date.

Lou Weigle, manager of industrial information systems planning and management for AT&T, is responsible for the planning and implementation of network solutions in some 19 AT&T manufacturing facilities. "We are trying to determine how to migrate our fiber networks to MAP," Weigle explained. "We don't have much broadband network experience, but we do have a large investment in factory networks that use twisted-pair and fiber-optic cable."

According to a study released at the conference, migrating current factory nets to MAP is a primary concern of potential MAP network users. At the behest of the MAP/TOP Users Group, CIMdata, Inc. of Wellesley, Mass., surveyed 237 members of the group concerning a variety of factory issues. Forty-five percent of the respondents claimed upgrading or retrofitting existing factory networks was their leading concern.

Although AT&T is most often thought of as a vendor, the company faces the same factory communications problems other manufacturers currently confront. "In one factory, we are faced with connecting factory devices produced by 23 different vendors," Weigle said.

Weigle explained many AT&T factories use the company's Starlan local network, which uses both twisted-pair wire and fiber-optic cable. "If we want to upgrade the bandwidth of the fiber, we don't tear it out, we simply change the electronics connected to the fiber to support more bandwidth." Weigle claimed fiber-optic cable offers higher bandwidth than coaxial cable and is impervious to electromagnetic interference.

According to Weigle, AT&T's PC 6300 and PC 6300 plus industrial workstations, and its 3B2 computers will be hooked to the fiber network. AT&T will also connect a prototype fiber-optic modem to the lightwave factory network.

AT&T began experimenting with MAP technology in May, when it established a pilot MAP network that Weigle claimed has since been transferred to the floor of an unnamed AT&T factory. He said use of the MAP net in a live production application allowed AT&T to realize cost savings over the previous networking method. Z

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Job Function Which one of the following best describes your functional involvement with communications (data, voice, and/or video) products? Circle ONE only. 1. Business Management, Planning and/or Development Communications System/Network 2. Management, Planning and/or Development 3. Implementation and/or Operation Which one of the following best describes the primary business activity of your organization at this location? Circle ONE only 11. DP/Communications Consulting Services 12. Consulting Services (except DP/Communications) 13. Manufacturer (other than computer/communications) 22. Finance/Banking/Insurance/Real Estate 25. Wholesale/Retail Trade 26. Public Utility/Transportation 27. Mining/Construction/Petroleum Refining/ Agriculture/Forestry Business Services (excluding DP/Communications) 29. Government: Federal 30. Government: State/Local 41. Carrier: including AT&T, BOCs, Independent Telcos, Public Data Networks, Intern'l Records Carriers 43. Manufacturer Computer/Communications Equipment 44. Value Added Reseller (VAR), Systems House, Systems Integrator 46. DP/Communications Services (excluding consulting) In which ways do you typically become involved in acquiring communications products (data, voice, and/or video) and services? Circle ALL that apply. 1. Recommend/Specify 3. Approve the Acquisition 2. Identify/Evaluate Potential Vendors 4. None of the Above Check ALL that apply in columns A and B. A. 1 am personally involved in the acquisition process (specification, selection, approval) for the following products and services: B. These products and services are presently in use at this location: A B Product/Services A B Product/Services Transmission/Network Services Equipment 18. 🗆 ☐ Microwave ☐ Satellite Earth Stations 03. 

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3270 Controllers Telecommunications ☐ Key Systems Central Office Equipment Integrated Voice/Data Estimated value of communications systems, equipment and services: A. which you helped specify, recommend or approve in last 12 months? Check only ONE in column A. B. which you plan to specify, recommend or approve in next 12 months? Check only ONE in column B.

\$100,000-250,000 Over 10 million 6. 🗆 

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# ► LONG DISTANCE

# FCC warns: user beware

BY KARYL SCOTT

Washington, D.C. Correspondent

WASHINGTON, D.C. — The Federal Communications Commission last week warned telephone customers to beware of little-known telephone companies offering unlimited long-distance service for a flat monthly fee or, better yet, for free.

If the long-distance deal sounds too good to be true, it probably is, say regulators who are currently investigating a number of long-distance resellers engaged in so-called pyramid marketing schemes.

In such a scheme, customers pay a flat fee for a month of unlimited long-distance calling. Customers are told they can whittle down that cost by attracting new clients for the long-distance service. In one such scheme, customers paid \$100 per month but could earn \$25 for each new client they signed up.

Pyramid marketing practices pose problems consumers should be aware of, according to the FCC. The people who make the most money are those at the top of the pyramid, or the first to sign up. Those at the bottom, the later entrants, may earn little or nothing.

Also, some resellers have been unable to provide promised services. Several have gone bankrupt and did not refund initial deposits paid by customers. In other cases, state regulators have launched investigations of resellers and have, in a few cases, filed suit.

The FCC said these resellers typically lease 800 and Wats lines from AT&T and other long-distance carriers, along with switching facilities from larger resellers. They then "aggregate customer traffic to take advantage of lower rates than would otherwise be available to the general public," the FCC said.

These resellers are usually small and are not regulated by the FCC. The companies are not required to file schedules of charges and practices and do not need FCC approval to operate. The only time the FCC becomes involved is if enough consumers complain to its enforcement division, according to Jacquiline Johnson, a carrier analyst there.

Independent Communications Network, Inc. (ICN) of Cody, Wyo., is one company that has gained the attention of both state and federal regulators. ICN is currently being investigated in at least four states. The Wisconsin Public Service Commission (PSC) ordered ICN, formerly of Wautoma, Wis., to stop doing business because it failed to provide information to the PSC on its ability to meet customer demands.

ICN was never granted permission to do business by the Wisconsin PSC, as is required by law, according to Murugan Kollengode, a public service engineer with the PSC.

Customers said that, in most cases, an attempt to make a long-distance call through ICN resulted in a busy signal.

"What we're concerned about is the disparity between what is promised and what is actually provided to customers," Kollengode said."

# Washington Update

■ MCI Communications Corp. last week signed an agreement with Martin Marietta Corp. to provide long-distance interexchange service as part of Martin Marietta's bid to win the \$4.5 million, 10-year contract for the Federal Telecommunications System (FTS) 2000. As prime contractor, Martin Marietta has assembled a team of vendors that will compete against AT&T and Boeing Computer Services Co. to provide telecommunications service to some 1.3 million users in the federal government.

In addition to long-distance service, MCI will provide special voice and data services. The seven regional Bell operating companies and Northern Telecom, Inc. are also in on the project. Martin Marietta had said earlier it might use a combination of long-distance services but settled on a single carrier instead. "MCI's fiber-optic capabilities, digital systems and private network features are

ideally matched to FTS 2000 requirements," said Thomas Pownall, the company's chairman and chief executive officer.

■ AT&T last week announced a companywide program of financial incentives designed to encourage employees to resign voluntarily. The program is apparently the first in a series of moves AT&T will take to trim its work force in the aftermath of the merger of the Communications and Information Systems divisions.

A spokesman said the program would help management "identify and retire unnecessary personnel." Some employees who do not participate in the program "will be involuntarily separated from the company," he said, but will receive the same benefits. He declined to cite the number of employees expected to participate in the program. Analysts say AT&T may lay off as many as 25,000 workers.

- Karyl Scott

#### Switch from page 2

The new Autoswitch 4000 represents such a significant departure from Bytex's first generation of switches that it is unclear whether it is fully compatible with Bytex's current offerings. At a press conference here last week, a Bytex official would only say the 4000 "can be networked" with earlier switches. These switches include the Bytex Autoswitch 240, which supports a maximum 240 ports, and the Autoswitch 480, which supports 480 ports.

Although Bytex, which markets only matrix switches, is considerably smaller than many competitors offering broader product lines, the company has captured an impressive 35% share of the matrix switch market, according to International Data Corp., a market research concern based in Framingham, Mass. At least part of that market share has been provided by IBM, which sells the Bytex switches through an OEM arrangement.

The Autoswitch 4000 is composed of a central switch capable of supporting up to 16 satellite units. The distributed modules, which are connected at 40M bit/sec, can accommodate up to 256 ports. The company has pledged to provide fiber-optic support by second quarter 1987 and T-1 support at a later,

as-yet unspecified date.

The 4,096-port switch is non-blocking for all ports at 19.2K bit/sec. No other stand-alone switch unit on the market supports as many nonblocked ports, according to industry analysts. The nonblocking feature means the switch's 4,096 ports can support 2,058 simultaneous pass-through connections. The switch supports V.35, X.21, RS-232 and analog interface cards, which can be added and removed without disrupting switch operation.

The unrestricted I/O scheme is a feature offered by competitor T-Bar, Inc. in its Galaxy and Monolith switches. Earlier matrix switches—including some current product offerings—were based on a square architecture, such that a 512-port switch was described as a 256 X 256 matrix. An equal number of ports were designated as input or output and had to be used accordingly.

Bytex prices the Autoswitch 4000 at around \$350 per port for an 800-port configuration, with perport cost dropping for larger switches. Charles Robbins, president of Strategic Market Trends in Stoughton, Mass., said "There's no question it's expensive, but for the larger user, there may not be the same sensitivity to price."

# ATT from page 1

Frank Dzubeck, president of Communications Network Architects, Inc., a Washington, D.C.-based consulting firm. The goal is to handle electronic speech, mail, telephone message center pink slips and facsimile images as digital data. Integration efforts will, ideally, make it possible to provide what AT&T calls a unified mailbox capable of handling all types of mail.

If realized, it would be possible for an AT&T PC 6300 user to retrieve AT&T Audix voice mail, electronic mail delivered by AT&T Mail, the company's wide-area electronic mail network, telex messages and electronic mail created under Unix, IBM and Wang environments. Farther down the road, the same micro user will also be

able to access images transmitted from facsimile machines.

The company has also told large accounts that it is developing voice store-and-forward add-on boards for its Unix PC that will enable users to send text and mail messages to other remote or local personal computer users.

Underlying the company's message services is AT&T Message Transfer Architecture, consisting of Message Service Architecture, which describes how information is exchanged between systems, and Content Description Architecture, which describes message content.

Message Transfer Architecture is said to be compatible but more robust than the CCITT's X.400 Message Handling System. AT&T has committed to testing an implemen-

tation of X.400 Message Handling System next year, but it will typically gateway its architecture to the standard.

While the bulk of AT&T's message to clients involves the strategic alignment of existing products, perhaps one of the most intriguing products bundled into the pitch involves document interchange with systems from other vendors.

The product that will make this possible, known as Document Exchange within AT&T, is a software program supported on the company's 3B2 family of supermicrocomputers. Document Exchange will make it possible to translate revisable form documents and mail messages for transmission between heterogeneous word processing systems. As initially released, it

will act as a server through which remote systems will be routed for translation services. The sending party need only know the intended recipient's address, AT&T has assured customers..

According to a document provided by one AT&T account, when released. Document Exchange will translation support between: AT&T Office Telesystems, AT&T Mail, IBM Profs, IBM Disoss (as by Displaywriters, supported 5520s, 8100s, Personal Computers with Professional Services, System/36, and the System/38 via a Personal Computer or Displaywriter 3), Wang OIS and VS environments, MS- and PC-DOS systems running an AT&T Mail PC Access program, Displaywriter 2 and 3 and Multimate. 2

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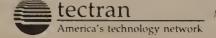
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# ► TELECOM POLICY

# **Dole bill awaits destiny**

BY KARYL SCOTT

Washington, D.C. Correspondent

WASHINGTON, D.C. — The fate of the increasingly controversial Telecommunications Policy Act of 1986 hangs in the balance as congressional policymakers prepare for an Oct. 3 adjournment and industry opponents apply strong pressure to defeat the bill.

The U.S. Senate Commerce Committee held its final hearing last week on the bill. If passed, it would transfer authority over the AT&T and GTE consent decrees from the Department of Justice and U.S. District Court Judge Harold Greene to the Federal Communications Com-

mission.

As in the preceding week, the Senate hearing room was packed with lobbyists, as key corporate representatives testified on the bill. Only four of the 17 Commerce Committee members attended the hearing.

Committee Chairman John Danforth (R-Mo.) now must determine whether to put the bill on a fast track to passage or let it languish until next year. The bill's sponsor, Senate Majority Leader Robert Dole (R-Kan.), has asked Danforth to expedite matters. But the apparent lack of interest on the part of committee members indicates that more time may be needed for legis-

lators to consider the ramifications of the bill.

Among those testifying against the bill were Charles Marshall, vice-chairman of AT&T; William McGowan, chairman of MCI Communications Corp.; Charles Skibo, president of US Sprint Communications Co.; and George Vasilakos, president of ALC Communications Corp. Also testifying were Gene Kimmelman, legislative director of the Consumer Federation of America, and James Fischer, who spoke on behalf of the National Association of Regulatory Utility Commissioners.

"The proposal to strip the federal court of its ability to enforce an existing decree in an antitrust case is not just a bad idea," MCI's McGowan said, "it's unnecessary, unfair, unconstitutional and wholly unprecedented. The BOCs' monopolies give them the ability and

incentive to discriminate against competitors. And the FCC was unable to prevent these abuses."

Vasilakos concurred. "Because the FCC has indicated its willingness to allow the BOCs to expand into other businesses, powerful local companies could discriminate and drive out other long-distance competitors," he said.

Representing equipment manufacturers, John McDonnell, vicepresident of the Electronic Industries Association, noted, "The real issue is not which government authority administers the consent decree but whether or not the BOCs will be permitted to manufacture telecommunications equipment while they still have a monopoly on [local exchange] facilities,'' he said. 'It is extremely bad public policy when a utility monopoly is allowed to manufacture the equipment used in the provision of that service."  $\mathbf{Z}$ 

#### Netview from page 1

Netview, announced in May and scheduled for shipment shortly, consolidated five autonomous IBM network management products into one offering so users could monitor and control devices such as frontend processors, controllers and terminals.

The package was initially hailed as a first step toward integrated network management. However, important components common to IBM customers' nets remained outside the Netview umbrella. With the latest release, IBM opened the umbrella wider to cover those items and moved to make Netview the de facto net management standard.

The cornerstone of the new products is Netview/PC, a \$2,000 software program to be shipped during the third quarter of next year. Netview/PC, which runs on an IBM Personal Computer, is a subsystem layered on top of IBM's PC-DOS 3.2 operating system. With the software, a Personal Computer can act as a gateway between Netview and other vendors' net management products, which transmit alert conditions to Netview.

ew. Vendors must use Netview/PC's

Application Program Interface/ Communications Services, a programming interface, to translate network management information for Netview. Seven vendors contacted by IBM before last week's announcement said they would use the interface to tie their network management systems to Netview. They included Timeplex, Inc., Network Equipment Technologies Co., Datatel, Inc., DMW Group, Inc., Teleprocessing Products, Doelz Network, Inc. and Industrial Networking, Inc.

Analysts expect other vendors to follow suit once IBM publishes the interface specifications. William Warner, director of business and systems management for the communications programming laboratory at IBM's Raleigh, N.C., facility, said the specifications will be available in six weeks.

Observers said Netview/PC has limitations. Even with the new offering, a Netview operator is unable to run diagnostics or reconfigure lines controlled by another vendor's system. That capability will be provided in a future release of the product, IBM said.

IBM also announced three application programs that work with

Netview/PC to collect network management information.

Release 1.1 of the IBM Token-Ring Network Manager enables a user to transmit Token-Ring Network management information to Netview. Previously, this information could be used only on the local network. The new release costs \$1,495, and current customers can upgrade for \$85.

Netview/PC Rolm Alert Monitor, which costs \$6,500, detects error conditions and alarms for as many as 10 Rolm PBXs and forwards that information to Netview. PBXs are polled for voice and switched data errors, software restarts, switch-overs and T-1 alarm conditions. Telephony, switched data and T-1 status information can be polled at different intervals.

Netview/PC Rolm Call Detail Collector, also priced at \$6,500, collects call detail records from Rolm, AT&T and Northern Telecom, Inc. PBXs. The information can then be sent to IBM mainframe voice net management applications or to another vendor's computer system.

The latter two programs are particularly significant because, when paired with new mainframe software, they represent IBM's first effort to integrate voice network management capabilities into SNA. "IBM has told its users that it is OK to pull traditional voice functions, such as a PBX, under data processing," noted Frank Dzubeck, president of Communications Network Architects, a Washington, D.C. consulting firm.

Support for voice network management functions is supplied by three applications that run under IBM's TSO subsystem on a mainframe under MVS.

IBM Netview Network Billing System, a telephone call accounting system priced at \$1,585, can produce call detail reports from information gathered by Netview/PC Call Detail Collector or stored on Centrex tapes.

Netview Traffic Engineering Line Optimization System, priced at \$1,900, helps a user configure the least costly network of Wats and foreign exchange lines.

Netview Tariff Data Base contains current tariffs for services from AT&T, MCI Communications Corp., regional Bell operating companies and US Sprint Communications Co. IBM said the tariff application, which costs \$2,000, would be upgraded quarterly. Z

# Rates from page 1

mitigate private-line hikes, and users will benefit from an overall rate reduction of roughly 10% during the period from 1986 to 1989.

The reduction, the study said, reverses the trend that began with divestiture. Since then, the cost of all services has increased on an average between 6% and 9%.

Titled "Divestiture Impact: 1986 and Beyond," the report examines the effect of rate changes on companies operating nationally as well as regionally. A breakdown of future rates indicates that interstate direct distance dial rates will fall by 28%; Wats services rates will fall by about 23%; and private-line rates will increase by 5% for regional and nationwide companies.

Intrastate call rates for companies doing business on the national level will fall by about 9% and 14% for direct distance dial and Wats

services, respectively. Private-line service rates will increase by 13%.

For companies whose business is primarily regional, direct-dial service rates will drop by about 11%. Wats rates will go down by 14%, and private-lines rates will go up 17%, the report said.

According to the study, four major forces will drive the downward trend in phone rates:

■ An end to so-called residential protectionism, meaning that regulators are easing up on demands that business users subsidize residential phone service through higher rates for businesses.

The Federal Communications Commission and state regulatory bodies are altering this trend, as evidenced by the FCC-imposed residential customer access line charge.

■ Lower inflation, which is translating into lower wage payments

and reduced capital costs for telephone companies.

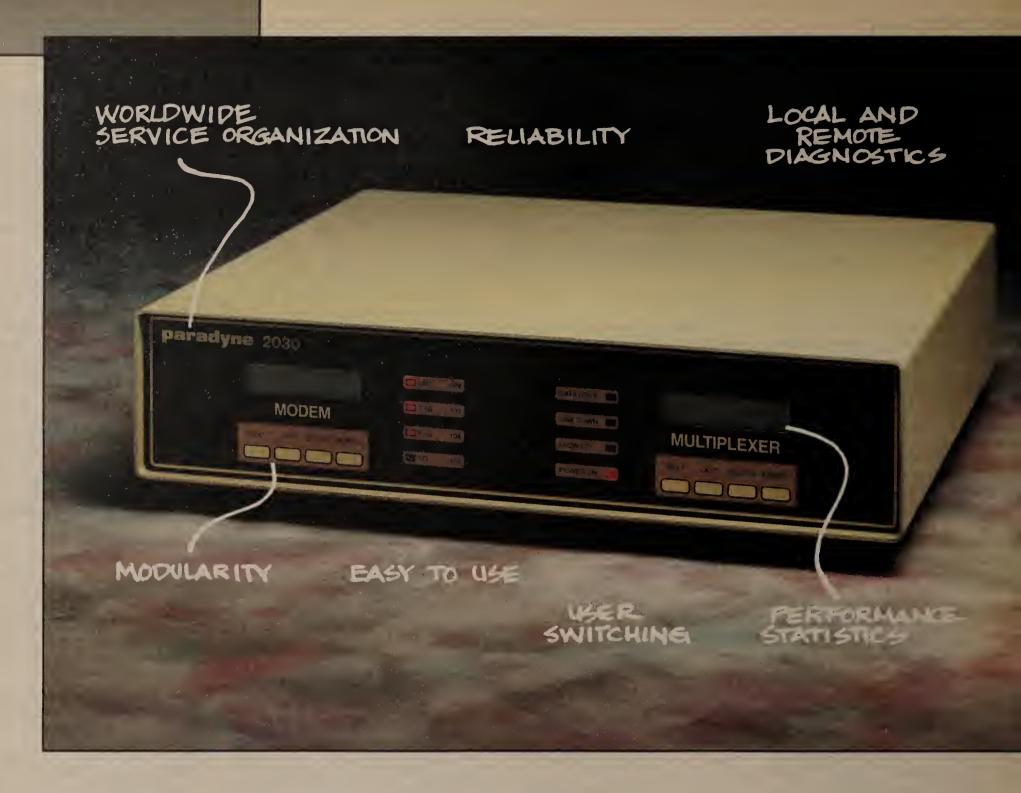
- Continuing technological advances, resulting in greater productivity and lower unit cost for services.
- Continued competition and deregulation of services.

The report also predicts a shift in the regulatory tide that will result in lower rates of return for carriers and fewer rate increases. This development, plus the shift of the access burden to the residential user, will bring about the 28% drop in long-distance direct-dial rates.

The study maintains that regulatory measures allowing carriers to depreciate capital equipment more quickly will at first increase rates. But in the long run, faster depreciation will encourage the installation of advanced equipment, thereby improving productivity and lowering operating costs and rates.

While the bad news concerns private-line increases, on the interstate level, those services will only increase by 4% to 6% through the rest of the decade.

"The biggest trend is that most carriers are offering services that are switched rather than dedicated," said George David, vice-president of product planning at CCMI/McGraw-Hill. "This underscores the fact that more and more people are moving toward switched services. There will always be private lines for big companies. But they will be diminished in size, and fewer companies will be able to support them."



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